An Arms Control Association Report

Assessing Progress on Nuclear Nonproliferation and Disarmament

2009–2010 REPORT CARD

October 2010

Peter Crail with the ACA Research Staff

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Cover Photos

Top row, from left: Amn Josie L. Kemp, USAF; Christopher Furlong/Getty Images; National Nuclear Security Administration/Nevada Site Office. Center: Official White House Photo by Chuck Kennedy. Bottom row: Joe Klamar/AFP/Getty Images; Lou Oates/iStockphoto.com; Majid Saeedi/Getty Images.

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Preface

Since the dawn of the nuclear age, the international community has recognized the need to control the spread and prevent the use of nuclear weapons but has struggled to agree on a common strategy.

In its first resolution adopted in London in January 1946, the United Nations General Assembly embraced the goal of eliminating all nuclear weapons and other "weapons adaptable to mass destruction." Later that year, the U.S. government produced the Acheson-Lilienthal report and Baruch Plan and the Soviet Union offered its own Gromyko Plan, all ostensibly aimed at achieving a nuclear-weapon-free world.

Though early proposals to control the bomb failed to gain traction, a body of mutually reinforcing, internationally recognized standards, norms, and legal obligations for nuclear disarmament, nonproliferation, and nuclear material security has gradually emerged. Centered on the nuclear Nonproliferation Treaty of 1968, this regime is now embraced by the vast majority of the world's nations and is viewed as a critical element of the international security architecture.

This nonproliferation, disarmament, and nuclear security regime has been regularly updated and reaffirmed through treaty review conferences, annual UN resolutions, new Security Council decisions, semi-regular national statements of policy, ad hoc coalitions, and through concrete actions.

Though uneven and incomplete, this body of self-imposed standards and commitments provides a useful baseline for measuring progress toward a world without nuclear weapons. As such, it applies to all countries, whether inside, outside, or at odds with the regime.

Purpose of the "Report Card"

As an education and policy advocacy organization dedicated to reducing the threats posed by the world's most dangerous weapons, the Arms Control Association believes it is essential that states meet their nuclear nonproliferation and disarmament standards and objectives and that the public has the information and tools necessary to help hold governments accountable.

Jewel Samad/AFP/Getty Images

A Pakistani girl participates in a 2005 anti-nuclear weapons demonstration calling on India and Pakistan to halt the testing of nuclear-capable-missiles. Both countries continue to expand their nuclear weapons capabilities and have not yet signed the Comprehensive Test Ban Treaty.

This report is an ambitious attempt to describe what constitutes the "mainstream" of nonproliferation and disarmament behavior expected of responsible members of the international community, and to provide a straightforward, transparent measurement of the performance over the past 18 months of 11 key states in meeting 10 major, universally-recognized nuclear disarmament, nonproliferation, and nuclear security standards.

Although every state has some responsibility to uphold and support these standards, the record of those states possessing nuclear weapons—the United States, Russia, United Kingdom, France, China, India, Israel, Pakistan—nuclear weapons aspirants—North Korea—and those that are under investigation for possible nuclear weapons-related activities—Iran and Syria—is most critical to the health of the nuclear disarmament, nonproliferation, and nuclear security regime and to international peace and security, and is therefore the focus of this report.

Thus, our report card assesses the performance of the 11 key states according to a clearly defined, "A" through "F" letter-grade scale for each of the 10 major nuclear nonproliferation, disarmament, and nuclear security standards. Instead of simply assigning grades and explaining them on the basis of a state's performance, we wanted to "show our work." We sought to be as transparent as possible about how the grades were assigned, with a clear rubric outlining the specific actions associated with each grade-level—from "A" through "F"—for each standard. Although in some cases we had to recognize that the existing standards apply differently, or exclusively, to NPT nuclear-weapon or non-nuclear-weapon states, delineating the grading criteria clearly also helped to ensure that the 11 states were being graded evenly, including those we chose to examine because they have been in violation of their nonproliferation obligations.

You will notice that our assessment *does not attempt to rank the 10 major standards and obligations* in order of importance or effectiveness. Clearly, depending on one's perspective on the nature of the nuclear threat, the performance of key states in some categories is more important to international peace and security. Instead, we have chosen to present our assessment of states' performance in each category and to provide and average grade for each state as a rough measure of overall performance for the past 18 months (January 2009–July 2010). After all, these standards will need to be met one way or another on the path to a world without nuclear weapons. In that vein, states that possess nuclear weapons will need to take more steps, and therefore meet more standards, to achieve that goal than states without.

Our report card is intended to provide *a snapshot of states' performance within the past 18 months* on these 10 standards. Because our intention is to increase the accountability of states as each year's opportunities and challenges play out, we have not graded them on the basis of their *cumulative* nuclear disarmament, nonproliferation, and nuclear security record. The standards and obligations that constitute the regime have changed over time, and such an approach would involve imposing a current-day assessment on 55 years of history. For instance, a simple comparison of the size of current nuclear stockpiles shows that the United States and Russia possess more than 90 percent of the world's nuclear weapons (approximately 9,600 and 12,000 respectively). China and the United Kingdom, on the other hand possess far fewer nuclear weapons (approximately 300 and 200 respectively). On this basis alone, China and the United Kingdom might be assigned better grades than the United States and Russia. But making an assessment on stockpile sizes alone would ignore the historical factors behind them. Moreover, the standard established by the international community with respect to nuclear stockpile numbers is, as Article VI of the NPT states, "effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament," and we are therefore grading movement in that direction, rather than overall numbers.

It is our intention that our report card can serve as a tool to help understand how much progress has or has not been achieved in each area in the past 18 months. Over time, such periodic report cards might also serve to track longer-term progress and trends. We hope to help provide a common basis for discussion about what more needs to be achieved by these states individually and collectively to further reduce and eventually eliminate the threats posed by nuclear weapons.

Lastly, we must stress that the standards in our report do not necessarily represent our ideal strategy for addressing the nuclear weapons threat. In our view, the existing obligations and commitments in certain categories are clearly insufficient, and key states' performance is inadequate to the task. It is imperative that states agree to meet more stringent standards and more ambitious goals and that the pace of progress be accelerated.

Indeed, there are other "report cards" that have been produced from time to time that have put forward a subjective set of policy recommendations to address the nuclear weapons threat and that judge states' performance or "compliance" with those policy recommendations. Such reports and measures, such as the Carnegie Endowment for International Peace's "Universal Compliance: A Strategy for Nuclear Security" report, their follow-up 2007 "Report Card," and *The Bulletin of the Atomic Scientists'* "minutes to midnight" clock are valuable contributions because they help raise public awareness and deliver fresh thinking about effective policy solutions.

We present this report card as tool for helping to hold states accountable to their existing nuclear disarmament, nonproliferation, and nuclear security commitments. We hope that it will help provide a common, factual basis for the ongoing, subjective political and moral discussion about how to prevent the further spread or use of these most deadly and destructive weapons.

DARYL G. KIMBALL
Executive Director,
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October 2010

Executive Summary

In this report, the Arms Control Association (ACA) identifies 10 nuclear nonproliferation standards established by the international community as critical elements of the nuclear nonproliferation regime and determines the extent to which a set of key states are fulfilling, abiding by, or promoting them. The intent is to assess, on a state-by-state basis, the progress that has been made and the challenges that remain in preventing the spread of nuclear weapons and reducing and ultimately eliminating the nuclear arsenals that exist today.

- Based on the wide distribution of grades calculated for some of the states with the most significant impact on nuclear nonproliferation, the regime is neither on the verge of crumbling nor on the precipice of success. Nearly all of these states have standards to which they are adhering and standards they have failed to implement or have even abrogated. Notwithstanding the states of concern, chosen precisely because of the challenges they pose for the regime by failing to meet many of these standards, the other nuclear-weapon-possessing countries all fall around the midrange of grade levels.

- The lack of transparency in many areas lowered grade levels in standards where transparency is key, such as International Atomic Energy Agency (IAEA) safeguards and the reduction of nuclear arsenals. Insufficient transparency also made it more difficult to assign a grade as such judgments had to be based on limited information or unofficial assessments. Some states possessing nuclear weapons have been reluctant to publicize information regarding the size of their stockpile and the alert status of their weapons. Moreover, Israel's policy of "nuclear ambiguity," in which it will neither confirm nor deny possessing nuclear weapons, meant that it was assigned grades denoting a lack of action with respect several standards because no declared actions have been taken.

- The norm against nuclear testing appears to be fairly well institutionalized among the five nuclear-weapon states. The 2009 shift in the U.S. position back toward support of the Comprehensive Test Ban Treaty (CTBT) has provided some momentum toward this long-standing goal of the international community, but U.S. and Chinese ratification remain vital to the treaty's entry into force. The non-nuclear Nonproliferation Treaty (NPT) states remain key hurdles, particularly as two of those states (India and Pakistan) have not signed the CTBT. Regional initiatives in South Asia and the Middle East are likely to be necessary to bring the non-NPT states, as well as Iran, into compliance with this norm. North Korea, the only country to have carried out a nuclear test in the past decade, is another major roadblock for CTBT entry into force and has not made any political commitment to forgo additional tests. Pyongyang's relative political isolation, however, may present a scenario in which the remaining CTBT Annex 2 states required for entry into force ratify the treaty regardless of North Korea's actions.

- The non-NPT states continue to pose a challenge regarding efforts to halt the production of fissile material for nuclear weapons. Although a fissile material cutoff treaty has not been negotiated yet, strong international calls for fissile material production moratoria for weapons purposes, in place for the nuclear-weapon states for more than

UN Photo/Eskinder Debebe

International Atomic Energy Agency (IAEA) Director-General Yukiya Amano addresses the 2010 nuclear Nonproliferation Treaty (NPT) Review Conference May 3, 2010. The conference final document included a 64-point "action plan" to strengthen the nuclear nonproliferation regime.

15 years, have established an international norm in this regard. Further, the declared cessation of such production by nuclear-weapon possessors in South Asia and the Middle East can contribute to regional security and ease concerns about arms races in those regions.

- Some states in possession of nuclear weapons have adopted a posture in which they are ready to use those weapons fairly rapidly, even during peacetime, rather than taking a more risk-averse strategy to prevent unauthorized or accidental use. In particular, Russia and the United States still retain many of their forces at Cold War levels of operational readiness and have defended that posture as necessary for security reasons. Progress on overall de-alerting may not be possible without reconsideration of the role of nuclear weapons in the security policies of these states.

- Nuclear-armed states received low-marks across the board for nuclear weapons reductions. Part of the reason is that, with the United States and Russia still maintaining roughly 90 percent of the world's nuclear arms, there is far less pressure on other nuclear-armed states to carry out any reductions. Although they possess the largest arsenals, the work that Washington and Moscow are carrying out to lower their stockpiles has earned them some credit. On the other hand, because the most recent British nuclear arms reductions were completed prior to the time frame of this report, it receives a fairly poor grade. Because this report measures whether or not there is an ongoing process of nuclear reductions rather than nuclear warhead levels, it does not reflect the positive role the United Kingdom plays in the nuclear disarmament effort by maintaining the lowest arsenal level of the five NPT nuclear-weapon states.

- Despite the positive role that nuclear-weapon-free zones (NWFZs) have played and are poised to play in reaffirming the pledges in the NPT and establishing regional standards and ownership over nuclear nonproliferation issues, the five nuclear-weapon states have remained selective in those they have chosen to support fully. Some Middle Eastern and South Asian countries examined by this report have supported the prospect of NWFZs, but have rebuffed international calls to establish such zones in their own regions.

- Most nuclear-weapon possessors have taken some steps to implement export controls, once a

practice widely decried outside the West. Several of these countries, including China, India, and Pakistan, were once or still remain targets of restrictions of sensitive nuclear and missile-related technology transfers. That export controls can now be recognized as an international standard at all is a positive development, although much work must be done to ensure that the export control laws on the books are actively enforced. This report does not directly address the enforcement issue in depth.

- Increasing attention to the issue of nuclear security, particularly in the aftermath of the September 11, 2001, attacks and the heightened concerns regarding threats from transnational terrorist groups has helped to bolster participation in efforts to protect nuclear material from theft or misuse. In 2010 these concerns culminated in the first-ever nuclear security summit, in which nearly 50 global leaders made pledges to enhance international nuclear security efforts. Although this report does not assess the effectiveness of state nuclear security measures, the preponderance of international instruments and multilateral initiatives has provided states with greater opportunities to demonstrate commitments to addressing this issue. Despite the fact that the United States has long maintained a leadership position in building international momentum, cooperation, and capacity to address nuclear security and nuclear trafficking concerns, its delay in ratifying two key international agreements that it has promoted as global standards diminished its grade, according to the criteria used in this report. It is expected that the U.S. grade would more accurately reflect U.S. efforts in this regard when the Senate adopts the corresponding legislation.

- Given North Korea's escalatory actions in the first half of 2009, it is of little surprise that it fares worst among all states. North Korea is also the only country to have declared its withdrawal from the NPT and established an economic enterprise proliferating missile and, in at least one case, nuclear technology. Pyongyang is therefore a clear nuclear nonproliferation outlier. Notably, the UN Security Council responded in 2009 to Pyongyang's actions with the strongest proliferation-related sanctions to date, and implementing those restrictions is a responsibility for all states seeking to strengthen the nuclear nonproliferation regime.

ACRONYMS

ACA	Arms Control Association
CD	Conference on Disarmament
CPPNM	Convention on the Physical Protection of Nuclear Material
CSA	Comprehensive Safeguards Agreement
CTBT	Comprehensive Test Ban Treaty
CTBTO	Comprehensive Test Ban Treaty Organization
FMCT	Fissile Material Cutoff Treaty
GTRI	Global Threat Reduction Initiative
HEU	Highly Enriched Uranium
IAEA	International Atomic Energy Agency
ICBM	Intercontinental Ballistic Missile
INFCIRC	International Atomic Energy Agency Information Circular
ITDB	Illicit Trafficking Database
MTCR	Missile Technology Control Regime
NAM	Nonaligned Movement
NPR	Nuclear Posture Review
NPT	Nuclear Nonproliferation Treaty
NSA	Negative Security Assurance
NSG	Nuclear Suppliers Group
NWFZ	Nuclear-Weapons-Free Zone
PrepCom	Preparatory Commission
PSI	Proliferation Security Initiative
RevCon	Review Conference
SLBM	Submarine Launched Ballistic Missile
SQP	Small Quantities Protocol
START	Strategic Arms Reduction Treaty
SORT	Strategic Offensive Reduction Treaty
UN	United Nations
WMD	Weapons of Mass Destruction

Introduction

The nuclear Nonproliferation Treaty (NPT) has long been recognized as the cornerstone of the nuclear nonproliferation regime. In the 40 years since the NPT entered into force, the treaty has been buttressed by additional agreements, shared norms, and common practices that together constitute international standards for preventing the spread of nuclear weapons and achieving their ultimate elimination.

The strength of those standards varies. Some standards, such as those regarding nuclear testing or International Atomic Energy Agency (IAEA) safeguards, are fairly specific, while others, such as reducing nuclear weapons alert levels, set expectations but do not outline specific actions. As the international community comes to agree on additional steps to strengthen the regime, the nuclear nonproliferation standards that states are expected to follow will likely become more demanding or outlined in greater detail. This has been a work in progress over the past 65 years.

Likewise, the responsibilities that states are expected to fulfill differ. Although all countries have roles to play in working toward nuclear disarmament and stemming proliferation by ensuring the responsible use of nuclear energy, the actions that certain countries take have a relatively greater impact on the health of the regime. Specifically, states that have acquired nuclear weapons have the responsibility to reduce their arsenals and engage in corollary steps toward their elimination in order to achieve the goal of a world without nuclear arms. At the same time, states in which there are outstanding nuclear proliferation concerns must provide practical assurances to the international community that they are not seeking them.

On this basis, the Arms Control Association (ACA) has focused this report on 11 states with particular responsibilities for advancing the goals of nuclear disarmament and nonproliferation. Five of these states are recognized in the NPT as nuclear-weapon states (China, France, Russia, the United Kingdom, and the United States), having tested nuclear weapons prior to 1967. Although these states continue to maintain nuclear arsenals to varying degrees, all have committed in the NPT to "pursue negotiations in good faith" to ending the nuclear arms race and to nuclear disarmament.

Another three states have never signed the NPT (India, Israel, and Pakistan) and developed nuclear weapons for reasons related to regional security concerns, aspirations of international prestige, or both. As in the case of the five NPT nuclear-weapon states, these three countries carry the responsibility to work toward nuclear disarmament as a condition for reducing the risk of nuclear war.

Two states (Iran and Syria) are NPT members currently under investigation by the IAEA for suspicions of past or present nuclear weapons programs. The IAEA has found Iran to have been in noncompliance

Randy Rydell

The Hiroshima Peace Memorial and accompanying memorial park serve as reminders of the first military use of a nuclear weapon on August 6, 1945, and as the site of an annual ceremony promoting world peace and nuclear disarmament.

with its safeguards obligations, and Syria has refused to account for evidence of undeclared nuclear activities. Because both countries continue efforts that undermine the nuclear nonproliferation and disarmament regime, it is important to highlight where corrective action is necessary to reverse such damages.

One state (North Korea) has declared its withdrawal from the NPT and developed a nuclear weapons capability after failing to come into compliance with its NPT obligations. Largely isolated from the international community, North Korea has been subjected to international sanctions and is the focus of a multilateral negotiations process to address the threats posed by its nuclear and missile programs. Despite North Korea's reluctance to abide by international standards in general, its responsibility to abandon its nuclear weapons capabilities and provide assurances against proliferation are still important to preserving the nuclear nonproliferation regime.

The focus on these 11 countries by no means suggests that other states do not have their own responsibilities to uphold nonproliferation standards and strengthen the nonproliferation and disarmament regime. The standards identified in this report have been established by the international community, and all states are responsible for upholding them. Moreover, it is important to recognize that the fulfillment of these standards is not a sufficient condition for a world free of nuclear weapons. Regional security issues, the spread of nuclear technology, and other factors will have a significant impact on achieving the goals of nuclear nonproliferation and disarmament. Nevertheless, they are necessary conditions for achieving those goals and are therefore important to fulfill in their own right.

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October 2010

Nuclear Nonproliferation Standards

Methodology

ACA uses letter grades to assess how the 11 states examined in this report fare in abiding by the 10 nuclear nonproliferation standards. The specific criteria outlined for each grade (A through F) serves as a baseline for allocating that grade. In general, the criteria for each standard will be consistent with the following actions:

Grade	Criteria
A	State is currently adhering to or exceeding the international standard.
B	State has taken significant steps to adhere to the international standard.
C	State has taken limited or declaratory steps to adhere to the international standard.
D	State has taken no action to adhere to the international standard.
F	State has taken steps inconsistent with or has rejected the international standard.

In some cases, additional positive actions in line with the standard may receive a "+" rating, for example, if actions were taken that may also be consistent some of the criteria to receive the next higher grade, but the state did not meet the baseline criteria to qualify for it. States may receive a "–" for taking actions contrary to the standard, even if a state meets the baseline criteria for the grade it has received. Although many of the standards examined are interrelated, a state's grade in one standard does not generally affect its grade in another.

Overall grades for each state and each standard are then calculated on the basis of a standard grade-point average with the following numerical values corresponding to each grade:

GRADE	A	A–	B+	B	B–	C+	C	C–	D+	D	D–	F
VALUE	4.0	3.7	3.3	3.0	2.7	2.3	2.0	1.7	1.3	1.0	0.7	0.0

The assessments themselves are primarily informed by the policies the state itself has declared, such as positions regarding treaties and agreements, multilateral arrangements it has joined, or domestic laws it has enacted to address nuclear nonproliferation issues. This report also draws on assessments by international organizations such as the IAEA and the Committee Established Pursuant to Resolution 1540 (1540 Committee), unclassified intelligence judgments, and recognized independent evaluations, as many of these standards involve issues for which official state policies and practices are not a matter of public record.

The time frame covered in this report is roughly January 2009 to June 2010. Because this report is measuring the status of the 10 standards for each

of the 11 states, however, it is not limited to actions specifically taken in that time frame, but includes national positions still held or continuing efforts to implement disarmament and nonproliferation goals. In some cases, particularly in regard to suspicions or evidence of proliferation, the time frame expands into the past few years for two reasons: a pattern of proliferation is far more indicative of state intent or complicity than isolated examples in a given year, and evidence to substantiate such proliferation takes some time before it becomes public.

Standards and Criteria

ACA research staff have identified 10 core standards that the international community has recognized as critical elements of the nuclear nonproliferation and disarmament regime. Each of these standards plays an important role in addressing the complex nature of the threat from nuclear weapons, but they are not necessarily equally vital in the path toward a world without nuclear weapons. Moreover, these standards are not static. As international conditions change and efforts to address nuclear proliferation adapt to new circumstances, the criteria by which these standards may be measured will necessarily change, and new standards agreed by the international community may become part of the body of established norms.

1. Banning Nuclear Testing

Initially called for in April 1954 by Indian Prime Minister Jawaharlal Nehru, a ban on nuclear explosive testing has been among the world's top arms control priorities for decades. Since 1963, nuclear tests have been prohibited in the atmosphere, underwater, in outer space, and in various nuclear-weapon-free zones (NWFZs) but not until the Comprehensive Test Ban Treaty (CTBT) opened for signature in 1996 did the international community have an international legal instrument banning all nuclear-weapon test explosions or any other nuclear explosion.[1] The treaty, which has yet to enter into force despite being signed by 182 countries, is intended to be a significant obstacle to additional states acquiring advanced nuclear weapons and nuclear-armed states adding new nuclear weapons designs to their arsenals. The 2000 NPT Review Conference recognized the CTBT's early entry into force as the first among 13 "practical steps" toward implementing Article VI of the NPT.[2] The UN Security Council reinforced this priority in Resolution 1887, which called on all states to refrain from testing and to sign and ratify the CTBT. Most recently, the 2010 NPT Review Conference specifically called on all nuclear-weapon states to ratify the CTBT "with all expediency," noting that those states "have the special responsibility to encourage Annex 2 countries … to sign and ratify."[3]

A country's commitment to banning nuclear testing is assessed by the extent to which it has adopted the CTBT. The assessment also takes into account whether or not countries which possess nuclear weapons are acting consistently with the treaty's aims by declaring a moratorium on nuclear testing.

Grade	Criteria: Banning Nuclear Testing	
A	State has signed and ratified the CTBT.	
B	*If in possession of nuclear weapons:* State has signed the CTBT, indicated its intent to ratify the treaty, and declared a testing moratorium.	*If not in possession of nuclear weapons:* State has signed the CTBT and signed and ratified the NPT.
C	*If in possession of nuclear weapons:* State has signed the CTBT and declared a testing moratorium, but has indicated that it does not currently intend to ratify the treaty.	*If not in possession of nuclear weapons:* State has signed and ratified the NPT.
D	State is not a member of the NPT and has not signed the CTBT.	
F	State has carried out a nuclear test in the time frame of this report or has declared its intent to carry out nuclear testing.	

2. Ending the Production of Fissile Material for Weapons

Proposals to control the production of fissile materials (highly enriched uranium [HEU] and plutonium) for weapons purposes have been offered since the start of the nuclear age. In 1993 the UN General Assembly passed a resolution calling for a "non-discriminatory, multilateral and internationally and effectively verifiable treaty" prohibiting the production of fissile material for nuclear weapons and other explosive devices. Such a ban would, at a minimum, cap the amount of material available to make nuclear weapons. The Geneva-based Conference on Disarmament (CD) reached consensus on a negotiating mandate for a fissile material cutoff treaty (FMCT) in 1995 (the so-called Shannon mandate), but procedural and substantive divisions within the 65-member body have prevented progress in negotiating such a treaty. UN Security Council Resolution 1887 calls on the CD to negotiate an FMCT and requests all states to "cooperate in guiding the Conference to an early commencement of substantive work." At the 2010

NPT Review Conference, states-parties similarly issued a call to "immediately begin" such negotiations. Whether states have earnestly pursued negotiations on an FMCT or obstructed efforts to complete such an agreement is one measure of their commitment to this long-standing goal of the international community. This report also considers whether a state has pursued such negotiations in line with the Shannon mandate as agreed in 1995. Although all CD members will have a role to play in the negotiation of an FMCT, this standard is primarily relevant to those states that have produced fissile material for nuclear weapons and will therefore only apply to them.

Grade	Criteria: Ending Fissile Material Production for Weapons
A	State has supported negotiations on an FMCT consistent with the Shannon mandate and has formally pledged not to produce fissile material for nuclear weapons.
B	State has supported negotiations on an FMCT consistent with the Shannon mandate and is not currently known to be producing fissile material for nuclear weapons.
C	State has expressed general support for an FMCT, but has opposed aspects of the Shannon mandate.
D	State has expressed opposition to negotiating an FMCT or blocked CD consensus to begin FMCT negotiations.
F	State continues to produce or is believed to be producing fissile material for nuclear weapons or has not ruled out such production.

3. Nuclear Weapons Alert Levels

States deploy their nuclear weapons in various stages of operational readiness. Some governments field warheads that are primed to launch in a matter of minutes, while other governments have put in place mechanisms to extend the time frame to launch to a period of days. Many observers worry that weapons configured for rapid firing pose greater risks of accidental, miscalculated, or hasty use. In 2007 and 2008, an overwhelming majority of states called on nuclear-armed countries remove their weapons from high alert and take steps to reduce their nuclear weapons readiness levels, meaning they should extend the amount of time needed to fire their systems.[4] NPT states-parties agreed at the 2000 NPT Review Conference to pursue "concrete agreed measures" toward that end and, in 2010, called on the nuclear-weapon states to "consider the legitimate interest of non-nuclear-weapon states in further reducing the operational status of nuclear weapons systems in ways that promote international stability and security." Widespread calls for further de-alerting are complicated by a lack of agreement on specific steps toward that goal and a lack of transparency on the part of nuclear-armed states regarding the time frame needed to employ nuclear weapons.

To measure adherence with this standard, this report will consider the extent to which a state has physical and procedural measures in place to delay the time frame to employ nuclear weapons and ensure proper authorization for their use. This assessment will also take into account whether a country's nuclear weapons are believed to be targeted against another state, a practice that the NPT nuclear-weapon states halted in the 1990s to prevent their accidental use against another country and welcomed by UN General Assembly resolutions.

Grade	Criteria: Reducing Nuclear Weapons Alert Levels
A	State is believed to maintain its weapons off alert, with its nuclear weapons de-mated from their delivery systems, and has measures in place to ensure proper authorization for their use.
B	State is believed to institute procedural measures to delay the time frame to employ nuclear weapons for an extended period and ensure proper authorization for their use.
C	State maintains nuclear weapons that are on high alert, or "prompt launch" and has measures in place to ensure proper authorization for their use.
D	State is not known to have measures in place to ensure proper authorization for the use of nuclear weapons.
F	Nuclear wareads are believed to be targeted at another country.

4. Nuclear Force Reductions

As part of the NPT, nuclear-weapon-state members committed to make progress toward ending the nuclear arms race and engaging in efforts toward nuclear disarmament. Non-nuclear-weapon states saw those commitments as an essential part of their bargain to forswear nuclear arms and their decision to agree to extend the treaty indefinitely in 1995.[5] At the 2000 NPT Review Conference, states-parties agreed that nuclear-weapon states should carry out further reductions of strategic and nonstrategic nuclear arms. The states-parties also agreed that the "principle of irreversibility" should apply to those reductions and that they be carried out in a transparent manner to enhance confidence and prevent cheating.

Furthermore, in one of the action steps outlined in the 2010 NPT Review Conference Final Document, the nuclear-weapon states committed to "further efforts to reduce and ultimately eliminate all types of nuclear weapons, deployed and non-deployed, including through unilateral, bilateral, regional, and multilateral measures."[6]

This assessment will take into account declared and reported steps taken by states to reduce their nuclear arsenals, including nonstrategic weapons where applicable. It will also consider whether such reductions are carried out in a manner that is transparent and irreversible, including the existence of formal verification measures, and whether warheads removed from deployment are dismantled. This standard will measure only ongoing efforts to reduce nuclear arsenals, and it does not take into account the existing size of those arsenals. This is not intended to prejudice those that have undertaken reductions to lower levels than others, but to encourage the continued pursuit of verifiable and irreversible reductions called for by the international community.

Grade	Criteria: Nuclear Force Reductions
A	State has taken steps in the time frame of this report to reduce the number of nuclear weapons in its possession. Nuclear weapons reductions were carried out under formal verification measures, and the warheads were verifiably dismantled.
B	State has taken steps in the time frame of this report to reduce the number of nuclear weapons in its possession. Nuclear weapons reductions were carried out under formal verification measures, but warheads were not verifiably dismantled.
C	State has taken steps in the time frame of this report to reduce the number of nuclear weapons in its possession. Nuclear weapons reductions were not carried out under formal verification measures.
D	State is not known to have taken steps in the time frame of this report to reduce its numbers of nuclear weapons.
F	State has continued to increase the size of its nuclear arsenal.

5. Negative Security Assurances

Negative security assurances (NSAs) are pledges by nuclear-weapon states not to use or threaten to use nuclear weapons against non-nuclear-weapon states. They are intended to reinforce nonproliferation by reassuring states that have foresworn nuclear weapons that they are not at risk of a nuclear attack. The value of NSAs was recognized in Resolution 1887, which "affirms that such security assurances strengthen the nuclear nonproliferation regime." In 1995 the UN Security Council adopted Resolution 984, recognizing unilateral NSAs by the five nuclear-weapon states. Although the five countries have reiterated these pledges, they are not legally binding. Moreover, some nuclear-weapon states have indicated that the use of nuclear weapons would be considered against non-nuclear-weapon states under certain circumstances. Still, the principle behind such assurances has been reaffirmed in NPT review conference decisions, including in 1995, 2000, and 2010. This report will assess whether nuclear-armed states have issued NSA pledges, the binding nature of those pledges, and whether they have reserved the right to use nuclear weapons in response to unconventional weapons threats from states that do not possess nuclear weapons. Because states that have adopted a no-first-use policy have indicated that they would only use nuclear weapons in response to a nuclear attack, they will be considered to have exhibited a very strong commitment to this standard.

Grade	Criteria: Negative Security Assurances
A	State has issued legally binding NSAs.
B	State has issued non-legally binding NSAs.
C	State has issued non-legally binding NSAs, but leaves open the possibility of using nuclear weapons in response non-nuclear attacks or threats from states that do not possess nuclear weapons.
D	State has not issued any NSAs.
F	State has openly threatened non-nuclear-weapon states with nuclear weapons.

6. Nuclear-Weapon-Free Zones

The concept of creating zones free of nuclear weapons began in the 1950s and has since become recognized by the international community as an important nuclear nonproliferation mechanism.[7] The potential for such regional efforts is recognized in Article VII of the NPT, which states that the treaty does not affect the right of states to conclude agreements "to assure the total absence of nuclear weapons in their respective territories." NPT agreements since the treaty's entry into force have endorsed the adoption of such zones, including the 1995 Resolution on the Middle East calling for the creation of a zone free of nuclear weapons and other weapons of mass destruction (WMD) in that region. That decision was integral to the indefinite extension of the treaty. Furthermore, in the 2000 and 2010 NPT review conferences, states-parties agreed that the establishment

UN Photo/Mark Garten

President Barack Obama chairs the first ever Security Council Summit on nuclear disarmament and nonproliferation Sept. 24, 2009. The 15 heads of state unanimously adopted Resolution 1887, which called for steps leading toward a nuclear-weapons-free world.

of NWFZs "enhances global and regional peace and security, strengthens the nuclear nonproliferation regime and contributes towards realizing the objectives of nuclear disarmament."

Outside the NPT, the UN General Assembly has adopted annual resolutions promoting the establishment of specific zones and the creation of such zones in general. Moreover, the international community has recognized that such zones need not all be regional in character. UN General Assembly Resolution 3261 F, adopted in 1974, notes that such zones can also be formed "by small groups of States and even individual countries."

The creation of these zones is not applicable only to non-nuclear-weapon states. Each established zone includes protocols to be agreed by the five nuclear-weapon states in which they pledge not to use, deploy, transfer, or test nuclear weapons anywhere in the region. Such a provision is intended both to reinforce the principle that nuclear weapons would be entirely absent from such a zone and to serve as an incentive for states to form a zone so that they would be protected from a nuclear attack.

In recognition of the divergent responsibilities for nuclear-weapon and non-nuclear-weapon states in regard to NWFZs, this standard will be measured by the extent to which non-nuclear-weapon states actively pursue such arrangements and nuclear-weapon-states agree to the relevant protocols. The nuclear-armed states that never signed the NPT are still considered non-nuclear-weapon states for the purpose of the treaty and this criteria.

Grade	Criteria: Nuclear-Weapon-Free Zones	
A	As an NPT nuclear-weapon state, the country has ratified the relevant protocols of all established NWFZs.	As an NPT non-nuclear-weapon state, the country has either signed and ratified a NWFZ in its region or has declared itself a NWFZ.
B	As an NPT nuclear-weapon state, the country has ratified the relevant protocols of at least three of the established NWFZs.	As an NPT non-nuclear-weapon state, the country has signed an established NWFZ in its region, taken steps to implement one, or proposed an NWFZ in its region or as a single state.
C	As an NPT nuclear-weapon state, the country has ratified the relevant protocols of at least one of the established NWFZs.	As an NPT non-nuclear-weapon state, the country has supported the establishment of NWFZs in general, but has taken no steps to conclude or abide by NWFZ arrangements itself.
D	As an NPT nuclear-weapon-state, the country has ratified no relevant protocols to the established NWFZs.	As an NPT non-nuclear-weapon state, the country has taken no steps to support the establishment of NWFZs in any location.
F	The state has opposed formal proposals to establish an NWFZ in its region or elsewhere or violated an existing nuclear-weapon-free arrangement.	

7. IAEA Safeguards

The NPT calls for non-nuclear-weapon states to allow IAEA safeguards on all of the nuclear facilities and activities where source or special fissionable material exists. Known as full-scope safeguards because they apply to a state's entire peaceful nuclear complex, these measures have become a condition for international nuclear trade.[8] The IAEA General Conference has frequently adopted resolutions calling on all non-nuclear-weapon states to adopt full-scope safeguards, and the UN Security Council issued a similar call in Resolution 1887.[9]

Since the early 1990s, however, the international community has recognized that full-scope safeguards are insufficient for providing assurance against undeclared nuclear activities in a state. The failure of traditional agency safeguards to detect illicit nuclear activities in Iraq, as well as problems in verifying North Korea's nuclear program, prompted the strengthening of IAEA safeguards and the development of the 1997 Model Additional Protocol. That protocol, which states adopt as an enhancement of their safeguards agreements, provides the agency with greater authority and tools to investigate all of a state's nuclear activities. The protocol is currently a voluntary measure, but the agency has maintained that, "without the additional protocol, the IAEA cannot provide credible assurance about the absence of nuclear material or activity."[10] The final consensus document of the 2000 NPT Review Conference encouraged all states-parties to adopt additional protocols "as soon as possible," a call NPT members reiterated in 2010. Resolution 1887 calls on all states to implement the protocol, "which together with comprehensive safeguards agreements constitute essential elements of the IAEA safeguards system." This report will therefore consider the extent to which non-nuclear-weapon states, whether or not a member of the NPT, have adopted safeguards.

Joe Klamar/AFP/Getty Images

The IAEA headquarters at the Vienna International Centre in Vienna, Austria. The agency's duties include verifying whether or not a state is in compliance with its safeguards obligations under the NPT.

Although all nuclear-weapon states have adopted voluntary safeguards on their civilian nuclear activities, they are not applicable to the assessment in this report because these are confidence-building measures that do not perform the same nonproliferation function as non-nuclear-weapon-state safeguards. That does not diminish their importance for promoting the universalization of IAEA safeguards and the Model Additional Protocol in particular.

Grade	Criteria: IAEA Safeguards
A	State has full-scope IAEA safeguards and an additional protocol in force.
B	State has full-scope IAEA safeguards in force.
C	State has an INFCIRC/66-type safeguards agreement in force.
D	State has not concluded any safeguards agreement with the IAEA.
F	State has been found in the time frame of this report to have violated its safeguards agreement or to have otherwise failed to cooperate with IAEA inspections.

8. Nuclear Weapons-Related Export Controls

In recent years, there has been increasing international recognition of the important role that export controls play in preventing state and nonstate proliferators from acquiring and sharing goods and technology relevant to nuclear weapons and the means to deliver them. Such controls have traditionally been undertaken on an informal basis by groups of like-minded suppliers of such technologies, particularly by the 46-member Nuclear Suppliers Group (NSG), controlling nuclear exports, and the 34-member Missile Technology Control Regime (MTCR), controlling technologies relevant to nuclear-capable delivery systems. In 2004 the UN Security Council required states to adopt export controls on all non-conventional weapons-related goods and technologies and their means of delivery with the adoption of Resolution 1540. Further, the council has incorporated the NSG trigger list and MTCR guidelines in its sanctions resolutions on Iran and North Korea, giving further weight to the utility of those export control regimes. Most recently, the 2010 NPT Review Conference encouraged states-parties "to make use of multilaterally negotiated and agreed guidelines and understandings in developing their own national export controls."[11]

This standard will be measured by the extent to which states have committed to abide by international export control standards established by the NSG and MTCR or, short of that, their efforts to implement

the nuclear and missile-related controls consistent with the requirements in Resolution 1540. This report does not assess the strength of the national controls states have in place to meet their export control commitments, although it will take into account patterns of export control violations by a state or its nationals.

Grade	Criteria: Nuclear Weapons-Related Export Controls
A	State is a member of or adherent to the NSG and MTCR.
B	State is a member of or adherent to the NSG or MTCR.
C	State has taken some steps to implement export controls on goods and technology relevant to nuclear weapons and their means of delivery on a national basis or is an NSG and/or MTCR member that has failed to fully enforce its export control commitments.
D	State has taken no known steps to implement export controls on goods and technology relevant to nuclear weapons and their means of delivery.
F	State is known or widely suspected to be engaged in ongoing efforts to export or import goods or technology in violation of NSG or MTCR guidelines, UN Security Council nonproliferation resolutions, or the export control laws of other countries.

9. Nuclear Security Commitments

Over the past two decades, concerns have intensified over the prospect that unsecured nuclear materials might be stolen and smuggled to nonstate actors or states seeking nuclear weapons. Although nuclear security had long been seen primarily as a state's domestic responsibility, such risks have led to more extensive efforts to develop international nuclear security standards, to mandate that all states develop national nuclear security measures, and to assist countries in that process. On an international basis, much of that work has been carried out by the IAEA, which has developed actions plans and standards for nuclear security and convened international conventions to seek legally binding commitments for that purpose.[12] These standards include the IAEA Code of Conduct on the Safety and Security of Radioactive Sources (IAEA Code of Conduct), which includes nuclear security guidelines that many states have made political commitments to follow. It also includes the Convention on the Physical Protection of Nuclear Material (CPPNM), which establishes standards for how states should protect nuclear materials designated for peaceful purposes during international transit. CPPNM members adopted an amendment in 2005 that extended those standards to nuclear material in domestic storage and transit. In 2004 the UN Security Council established an international mandate for all states to implement laws, regulations, and authorities to account for, protect, and secure nuclear material and facilities. NPT member states endorsed specific actions related to nuclear security in the 2010 NPT Review Conference Final Document, urging parties to implement the IAEA Code of Conduct, encouraging members to adhere to the CPPNM and adopt its amendment as soon as possible, and calling on all CPPNM parties to ratify its amendment.

Recognizing that nuclear security is largely a task for states to undertake with internal efforts to protect such material from unauthorized access, measuring the strength of those actions is outside the scope of this report. Rather, this study will measure the commitments states have made to adhere to international standards to improve their own national nuclear security architecture and the extent to which they are cooperating with others to raise such standards globally. Therefore, as a baseline, this standard will be measured by whether a state has ratified the CPPNM and taken steps to put in place nuclear security regulations consistent with the requirements of Resolution 1540. It will also measure whether a state has agreed to implement international nuclear security standards contained in the IAEA Code of Conduct or the CPPNM Amendment and engaged in multilateral cooperation to provide or receive assistance related to securing nuclear material and facilities.

Grade	Criteria: Nuclear Security Commitments
A	State has adopted domestic nuclear security measures consistent with international standards, ratified the CPPNM and its amendment, and has joined multilateral initiatives to strengthen nuclear security.
B	State has adopted domestic nuclear security measures consistent with international standards and ratified the CPPNM. State has ratified the CPPNM amendment or joined multilateral initiatives to strengthen nuclear security.
C	State has adopted domestic nuclear security measures consistent with international standards and ratified the CPPNM.
D	State has not adopted domestic nuclear security measures consistent with international standards and has not ratified the CPPNM.
F	State is known or widely believed to have illicitly transferred nuclear material to another state or nonstate actors in the time frame of this report.

10. Criminalization and Illicit Trafficking Commitments:

Following the attacks of September 11, 2001, and the expressed interest of al Qaeda and other terrorist groups in acquiring nuclear weapons, the threat of nuclear terrorism became increasingly acute. Therefore, in addition to securing nuclear materials and facilities to prevent unauthorized access, the international community has developed international mechanisms to directly address the actors that may be engaged in nuclear terrorism-related activities. These mechanisms are intended to bolster efforts by law enforcement and other responsible authorities to counter nonstate actors seeking to acquire nuclear materials for illicit purposes by putting in place appropriate domestic penal measures, preventing proliferation financing, and facilitating the international sharing of information on nuclear smuggling. A requirement to enact domestic legislation to criminalize unauthorized nuclear activities, establish appropriate penalties, and assign enforcement authorities was a central feature in Resolution 1540 and the International Convention for the Suppression of Acts of Nuclear Terrorism (the Nuclear Terrorism Convention),[13] which was agreed at a 2005 conference of UN members. The latter also calls for enhanced international cooperation to share information on nuclear terrorism-related activities. A critical tool for such information sharing is the IAEA Illicit Trafficking Database (ITDB), which was established in 1995 to serve as a catalogue of state-reported incidents involving a variety of unauthorized activities and events involving nuclear and radiological material. Resolution 1887 calls on all states "to improve their national capabilities to detect, deter, and disrupt illicit trafficking in nuclear materials," a call echoed by the 2010 NPT Review Conference Final Document. In 2010, NPT states-parties encouraged all members become party to the Nuclear Terrorism Convention "as soon as possible."

This report will first consider whether a state participates in the ITDB to share information on incidents related to the theft or loss of or trafficking in nuclear material. It will also take into account whether a state has joined the Nuclear Terrorism Convention and multilateral efforts to prevent nuclear terrorism, such as the Global Initiative to Combat Nuclear Terrorism and the Proliferation Security Initiative (PSI).

Grade	Criteria: Criminalization and Illicit Trafficking Commitments
A	State participates in the ITDB, ratified the Nuclear Terrorism Convention, and participates in multilateral cooperative arrangements on preventing nuclear terrorism and illicit trafficking.
B	State participates in the ITDB and ratified the Nuclear Terrorism Convention or participates in multilateral cooperative arrangements on preventing nuclear terrorism and illicit trafficking.
C	State participates in the ITDB.
D	State does not participate in the ITDB, has not ratified the Nuclear Terrorism Convention, and does not participate in multilateral cooperative arrangements on preventing nuclear terrorism and illicit trafficking.
F	State is known or widely believed to have illicitly provided nuclear or missile-related goods or technology to nonstate actors in the time frame of this report.

State-By-State Assessments

State-By-State Grades

	Nuclear-Weapon States					Non-NPT States			States of Concern		
Standard	**China**	**France**	**Russia**	**UK**	**U.S.**	**India**	**Israel**	**Pakistan**	**DPRK**	**Iran**	**Syria**
Banning Nuclear Testing	B	A	A	A	B	D+	C	D+	F	B-	C
Ending Fissile Material Production for Weapons	B	A	A	A	A	F	F	F	F	N/A	N/A
Reducing Nuclear Weapons Alert Levels	A	B	C	B	C	A	D+	A	D	N/A	N/A
Nuclear Force Reductions	F	C+	B-	D+	B-	F	D	F	F	N/A	N/A
Negative Security Assurances	B+	C	C	C	B	B+	D+	B	F	N/A	N/A
Nuclear-Weapon-Free Zones	B	B	C	B	C	C-	C-	C-	F	C-	C
IAEA Safeguards	N/A	N/A	N/A	N/A	N/A	C+	C	C	F	F	F
Nuclear Weapons-Related Export Controls	C-	A	C	A	A	A-	A	F	F	F	F
Multilateral Nuclear Security Commitments	B	B+	A-	A	B+	A	B	A*	D	D+	D+
Criminalization and Illicit Trafficking Commitments	B+	B+	A	A	B+	A	B+	B	D	C	D+
Overall Grade	**B-**	**B**	**B-**	**B**	**B**	**C+**	**C-**	**C-**	**F**	**D**	**D**

* This assessment does not take into account steps Pakistan has taken to address risks related to its internal political instability and the security of its nuclear arsenal, facilities, and material. The scope of this report does not address relative nuclear security needs or evaluate the strength of a country's nuclear security controls, only the scope of the controls in place as they relate to recognized international standards.

China

The last nuclear-weapon state to carry out a nuclear test prior to the 1967 cutoff established by the NPT, China remained outside of the nuclear nonproliferation regime for several decades thereafter, not joining the NPT until 1992. During that time Beijing is believed to have shared critical nuclear weapons technology, including weapons designs, with a number of states.[14] In recent years, Beijing has shown an increasing willingness to engage in nonproliferation efforts, including the adoption of export controls and the sanctioning of proliferators. Yet, Chinese entities are still believed to supply of goods and technology relevant to nuclear weapons and their means of delivery to states of proliferation concern. **Overall grade: B–**

1. Banning Nuclear Testing: B

China has maintained a nuclear testing moratorium since July 1996 and signed the CTBT in September of that year.[15] Beijing has declared its intent to ratify the CTBT and supports its entry into force, although China has claimed to be in the process of ratifying the treaty for nearly the past decade.[16]

2. Ending Fissile Material Production for Weapons: B

FMCT negotiations have been stalemated in past years partly due to China's insistence to link negotiations of an FMCT to work to prevent an arms race in space. China has exhibited greater flexibility in recent years, including joining the May 2009 consensus on the CD's program of work.[17]

Despite China's official statements in support of an FMCT, it has yet to officially declare a moratorium on fissile material production. Beijing reportedly ceased production of HEU for weapons in 1987 and of weapons-grade plutonium in 1991.[18] China is believed to have military stockpiles of about 20 metric tons of HEU and four metric tons of weapons-grade plutonium.[19]

3. Reducing Nuclear Weapons Alert Levels: A

Although China has provided very few details regarding its nuclear forces, independent analyses indicate that Chinese nuclear warheads are stored separately from their delivery systems during peacetime, maintaining a relatively "low alert" posture consistent with its no-first-use doctrine.[20]

Beijing abstained in UN General Assembly votes on resolutions calling for decreasing the operational readiness of nuclear weapons. Following such a vote in 2008, China explained that it would be willing to implement further measures when appropriate, but in light of disagreements over the effectiveness of reducing operational readiness, it would abstain.[21] China has also declared that its weapons are de-targeted. A 2009 defense white paper on China's nuclear forces states that, "[i]n peacetime the nuclear missile weapons of the Second Artillery Force are not aimed at any country."[22] China's Second Artillery Force maintains control over its strategic nuclear missile forces.

4. Nuclear Force Reductions: F

Exact numbers of China's nuclear force are not known publicly, but independent estimates suggest China may possess a total of about 240 nuclear warheads.[23]

Photo by Feng Li/Getty Images

A nuclear-capable DF-31 long-range ballistic missile on parade in Beijing. Of the five NPT nuclear-weapon states, China is the only nation believed to be expanding its nuclear arsenal.

Rather than reducing its arsenal, China is believed to be expanding its nuclear weapons stockpile "by roughly 25 percent since 2005," according to Pentagon estimates.[24]

5. Negative Security Assurances: B+

China issued unilateral NSA pledges in 1978 and 1995. These pledges are not binding.

A plus (+) is added to the grade because China is the only NPT nuclear-weapon state that has declared a no-first-use nuclear weapons policy.[25] China's 2009 defense white paper declares that "China remains committed to the policy of no first use of nuclear weapons, pursues a self-defensive nuclear strategy, and will never enter into a nuclear arms race with any other country."[26]

6. Nuclear-Weapon-Free Zones: B

Although China has signed NSA protocols to the Latin American, South Pacific, and African NWFZ treaties, it has not signed the protocols for the Central Asian and Southeast Asian zones. Yet, Beijing announced in April 2004 that it "undertakes unconditionally not to use or threaten to use nuclear weapons against … nuclear-weapon-free zones."[27]

7. IAEA Safeguards: N/A

China concluded voluntary-offer safeguards with the IAEA in 1999 with the signing of an additional protocol.[28]

8. Nuclear Weapons-Related Export Controls: C–

China joined the NSG in 2004 and applied to join the MTCR that same year, but has not yet been accepted as a member. Serious concerns remain over China's ability to control the proliferation of missile-related technologies by Chinese entities, and although Beijing has agreed to adhere to MTCR guidelines, it has not adopted the full annex, which includes a common list of controlled items.[29] China's national export controls include provisions related to export licensing, control lists, end-user controls, and import controls.[30]

Despite the adoption of its export control legislation, Chinese entities are still believed to be involved in exporting dual-use goods of relevance to non-conventional weapons and missile programs. A 2010 unclassified intelligence report to Congress on the acquisition of weapons of mass destruction states that "Chinese entities—which include private and state-owned companies and

individuals—continue to engage in WMD-related proliferation activities."[31] The report states that although China has adopted controls that approximate the MTCR, "enforcement continues to fall short." The United States continues to levy proliferation sanctions on Chinese entities, including two sets of sanctions for missile proliferation imposed in February and April 2009.[32]

(–) Another development of concern is that China indicated in 2010 that it is considering the construction of two nuclear power reactors in Pakistan, which is neither an NPT member nor under full-scope IAEA safeguards and therefore ineligible to receive such assistance under NSG rules. According to a senior U.S. official, "Without an exception granted by the NSG by consensus, Chinese construction of additional nuclear power plants in Pakistan beyond what was grandfathered in 2004 would be inconsistent with NSG guidelines and China's commitments to the NSG."[33]

Such a deal would also contradict the consensus document of the 2010 NPT Review Conference, which "reaffirms that new supply arrangements" for the transfer of nuclear materials and technology should require that the recipient accept "IAEA full-scope safeguards and international legally-binding commitments not to acquire nuclear weapons."[34]

9. Nuclear Security Commitments: B

China has a regulatory framework in place consistent with the IAEA Code of Conduct, which includes material accounting, material security, and licensing.[35] In 2007, China signed a "practical cooperation arrangement" to strengthen its national nuclear security measures.[36] Beijing acceded to the CPPNM in 1989 and ratified its amendment in September 2009. At the 2010 nuclear security summit, China pledged to cooperate in the establishment of a "nuclear security 'Center of Excellence.'"

10. Criminalization and Illicit Trafficking Commitments: B+

China participates in the ITDB and the Global Initiative to Combat Nuclear Terrorism.

A plus (+) is added to the grade because Beijing signed the Nuclear Terrorism Convention in September 2005.

France

France was the last of the five nuclear-weapon states to join the NPT, doing so in August 1992. France has declared that it possesses an arsenal of "less than 300" nuclear weapons, and it has taken steps in recent years to shut down key nuclear weapons facilities. Paris has been less supportive of the prospect of nuclear disarmament, insisting that its nuclear deterrent must be maintained for future contingencies. Meanwhile, France is one of the world's foremost suppliers of nuclear technology, providing it with a major role in stemming nuclear proliferation. **Overall grade: B**

1. Banning Nuclear Testing: A

An Annex 2 state, France ratified the CTBT in 1998, two years after declaring a testing moratorium. France is the only state possessing nuclear weapons that has closed its nuclear test site.

2. Ending Fissile Material Production for Weapons: A

France has supported negotiations on an FMCT and has argued that such negotiations should not be linked to other issues.[37] Paris has moved beyond a cessation of fissile material production by taking steps to dismantle its production facilities at Pierrelate and Marcoule and has invited experts to observe this dismantlement.[38]

3. Reducing Nuclear Weapons Alert Levels: B

France announced the de-targeting of its nuclear forces in 1997. Paris declared that it took steps in 1992 and 1996 to reduce the response times of its nuclear weapons and has employed "considerable technical means in addition to strict, rigorous, and effective procedures" to prevent their use without presidential authorization.[39] With these steps in place, French nuclear weapons are believed to be placed on "several days readiness" to fire.[40]

France voted against UN General Assembly resolutions on decreasing the operational readiness of nuclear forces in 2007 and 2008.[41] Explaining its 2007 vote, France said it "was not against reducing operational alerts, if security conditions [are] met, but the present text asks France to go further than it [has] already gone, however, and that could not be done."[42]

4. Nuclear Force Reductions: C+

In March 2008, President Nicolas Sarkozy delivered a speech in Cherbourg in which he discussed the future of France's nuclear forces, announcing that it would be reducing its arsenal by one-third, to comprise fewer than 300 nuclear warheads.[43] Independent estimates assess that these reductions were completed in late 2009.[44]

A plus (+) is added to the grade because Sarkozy indicated that France does not have any warheads beyond those in its operational stockpile, suggesting that it is dismantling those warheads in an irreversible fashion. No formal verification measures are in place to provide transparency for these reductions.

5. Negative Security Assurances: C

France issued unilateral NSAs in 1978 and 1995. It has pledged not to use nuclear weapons against non-nuclear-weapon states that belong to the NPT, unless it is facing an invasion or sustained attack against its territories, armed forces, or states with which it has a security agreement and the attack is in alliance with a nuclear-weapon state.[45]

The French nuclear strategy of "dissuasion" appears to be fairly expansive, leaving open the possibility of responding to threats of attacks of a non-nuclear

U.S. Navy photo by Mass Communication Specialist 2nd Class Rafael Figueroa Medina

A French Rafale M fighter performing a touch-and-go landing aboard the USS Dwight D Eisenhower in July 2009. France maintains two delivery systems for its nuclear weapons: fighter-bombers and submarine-launched ballistic missiles.

nature. A 2008 French defense white paper states that "the sole purpose of the nuclear deterrent is to prevent any state-originating aggression against the vital interests of the nation wherever it may come from and in whatever shape or form."[46]

6. Nuclear-Weapon-Free Zones: B

France has ratified protocols of the Latin American, African, and South Pacific NWFZs. It has not signed protocols associated with the Southeast Asian and Central Asian zones.[47]

7. IAEA Safeguards: N/A

France has had voluntary offer safeguards in force with the IAEA since 1981 and an additional protocol in force since 2004.[48]

8. Nuclear Weapons-Related Export Controls: A

France is an NSG member and serves as the "point of contact" for the MTCR. Paris maintains an extensive national export control system consistent with the requirements of Resolution 1540, including licensing provisions; measures related to deemed exports, end-user, transshipment, and re-export controls; and a catchall clause.[49]

9. Nuclear Security Commitments: B+

France has a variety of national controls and regulations in place in regard to nuclear security consistent with the requirements under Resolution 1540. These include the establishment of a nuclear regulatory authority, material accounting measures, physical protection regulations, and licensing for materials, facilities, and entities.[50] Paris joined the CPPNM in 1991. France is also a participant in the Group of Eight (G-8) Global Partnership and the Global Threat Reduction Initiative (GTRI).[51]

A plus (+) is added to the grade because Paris pledged during the 2010 nuclear security summit to work toward ratification of the CPPNM amendment.[52]

10. Criminalization and Illicit Trafficking Commitments: B+

France participates in the ITDB, PSI, and the Global Initiative to Combat Nuclear Terrorism.

A plus (+) is added to the grade because Paris signed the Nuclear Terrorism Convention in 2005.

Russia

In the aftermath of the Cold War, Russia inherited the massive nuclear arms stockpile accumulated by its predecessor, the Soviet Union, and continues to maintain an arsenal numbering in the many thousands. Beginning in the early 1990s, it did start to dramatically reduce its arsenal of about 40,000 nuclear warheads in accordance with arms control agreements with Washington. The two countries have worked together to secure nuclear material and facilities of the former Soviet Union and more recently have spearheaded multilateral initiatives to address the threat of nuclear terrorism. Moscow has had a long history of assisting other states with technologies applicable to nuclear weapons and missile programs. Over the last decade, however, it appears to have improved its efforts to prevent proliferation. **Overall Grade: B–**

1. Banning Nuclear Testing: A

Russia is an Annex 2 state, and its ratification of the CTBT is required for the treaty's entry into force. Moscow ratified the treaty in 2000 and has issued numerous statements since then in support of the treaty, including a joint statement with the United States on April 1, 2009.

2. Ending Fissile Material Production for Weapons: A

Moscow has supported negotiations on an FMCT and has declared that it ceased production of fissile material for nuclear weapons in 1994. Moscow is currently estimated to have about 950 tons of HEU and about 150 tons of weapons-grade plutonium. In 1993, Russia and the United States agreed to down-blend 500 tons of HEU from Russian warheads to low-enriched uranium (LEU) for civilian use. At the end of 2009, 382 tons of that HEU had been converted to LEU.[53] During the 2010 nuclear security summit, Russia signed a plutonium-disposition agreement with the United States in which both countries pledged to dispose of 34 tons of plutonium each.[54]

3. Reducing Nuclear Weapons Alert Levels: C

Russia is believed to maintain many of its nuclear weapons on a high-alert status. In early 2009, Col. Gen. Nikolai Solovtsov, the commander of Russia's intercontinental ballistic missile (ICBM) force, said that at least 96 percent of all Russian missile systems were "ready for deployment within several dozen seconds."[55] About 75 to 80 percent of Russian missiles are kept at this level of readiness, according to outside assessments.[56]

Russia abstained in a 2008 UN General Assembly vote supporting a resolution on reducing the readiness of nuclear forces. It was not present for a similar vote the year before.[57]

4. Nuclear Force Reductions: B–

In line with nuclear arms reduction agreements with the United States, Russia continued to lower the number of its deployed operational nuclear warheads in 2009. The 2002 Strategic Offensive Reductions Treaty (SORT) established a ceiling of 2,200 deployed strategic warheads by the end of 2012. SORT did not include verification measures and did not require the two states to dismantle warheads that were no longer being deployed.

On April 8, 2010, the United States and Russia signed the New Strategic Arms Reduction Treaty (New START), which established a new ceiling of 1,550 operationally deployed strategic warheads for each country, and a limit of 800 combined strategic delivery systems by the year 2017. The reductions will be carried out under new verification provisions, but those reductions will not apply to reserve warhead stockpiles. As of the publication of this report, that agreement must still be ratified by the legislatures of the two countries.

In spite of these steps taken by Russia to reduce its strategic nuclear weapons, Moscow has resisted calls to take steps to reduce its nonstrategic weapons, and there are concerns that Russia has instead increased its reliance on these systems.[58] In particular, Moscow has often linked the issue of nonstrategic weapons reduction to the U.S. deployment of nuclear weapons in Europe. Russia is believed to possess 2,000 to 6,000 nonstrategic warheads overall.[59]

A minus (–) is added to the grade because SORT did not include verification provisions. When START expired on Dec. 5, 2009, nuclear reductions were no longer subject to formal verification requirements. New START will replace SORT when it enters into force, and formal verification measures will resume.

5. Negative Security Assurances: C

Russia issued unilateral pledges not to attack non-nuclear-weapon states with nuclear weapons in 1978 and 1995. Moscow has indicated that those pledges would not apply in cases in which it was attacked by a non-nuclear-weapon state in association with a nuclear-weapon state.[60] Yet, Russian officials appear to have asserted that Moscow may use nuclear weapons against an ally of a nuclear-armed state even if it has not been attacked. In 2008, responding to U.S. plans at the time to station missile interceptors in Poland, Deputy Chief of General Staff Gen. Anatoly Nogovitsyn told the Interfax news agency that Poland could be targeted for a nuclear attack because of such cooperation, indicating that Russian military doctrine provides for the use of nuclear weapons "against the allies of countries having nuclear weapons if they in some way help them."[61]

6. Nuclear-Weapon-Free Zones: C

Russia has ratified the relevant protocols for the Latin American and South Pacific NWFZs. It has not signed the protocols for the Southeast Asian and Central Asian zones and has signed but not ratified the African NWFZ protocols.[62]

7. IAEA Safeguards: N/A

Moscow's voluntary safeguards agreement entered into force in June 1985, and its additional protocol did so in October 2007.[63]

8. Nuclear Weapons-Related Export Controls: C

Russia is a member of the NSG and MTCR. It has a number of national export control measures in place to prevent the spread of nuclear and missile technologies, including export control legislation, licensing provisions, deemed exports restrictions, end-user controls, a catchall clause, and controls over re-export and transshipment.[64]

Unclassified U.S. intelligence reports assess, however, that Russia continues to provide dual-use goods and technologies that may contribute to proliferation in the Middle East and South Asia, including Iran's

VLADIMIR RODIONOV/AFP/Getty Images

Russian President Dmitry Medvedev (center) inspects a Topol-M long-range ballistic missile at the Teikovo missile division in the Ivanovo Region on May 15, 2008. Moscow is believed to possess an estimated 12,000 nuclear warheads of all types, the largest number of any country.

missile programs.[65] It is unclear the extent to which such transfers are taking place with the knowledge or complicity of the Russian government.

9. Nuclear Security Commitments: A–

Domestically, Russia has implemented measures to account for and secure production, use, storage, and transport of nuclear weapons and related materials.[66] Regulations for the physical protection of nuclear facilities and materials, licensing, and nuclear facility personnel are also in place. Russia has expressed its intention to adhere to the IAEA Code of Conduct. Moscow joined the CPPNM in 1983 and its amendment in 2008. Russia participates in the G-8 Global Partnership and the GTRI.

On April 15, 2010, immediately following the 2010 nuclear security summit, Russia shut down its last remaining civilian reactor, which produces weapons-grade plutonium.

A minus (–) is added to the grade because, in spite of these commitments, independent assessments suggest that the Russian government has not developed a comprehensive strategy for reducing risks related to its fissile material stores and devotes insufficient resources to securing its stockpile.[67] For example, "a substantial number" of Russian HEU-fueled reactors remain outside the scope of GTRI conversion efforts, and no such reactors in Russia had been converted to LEU use by 2009.[68] As a result, HEU and plutonium are still present at a large number of sites, the security of which remains in question. Moreover, Russia continues to produce HEU fuel for the Soviet-built research reactors abroad, although these reactors are being slowly converted to LEU use.

10. Criminalization and Illicit Trafficking Commitments: A

Russia participates in the ITDB and ratified the Nuclear Terrorism Convention in 2006. It is a partner in the PSI and the Global Initiative to Combat Nuclear Terrorism.

United Kingdom

The United Kingdom was the third state to test a nuclear weapon and played a major role in the first successful nuclear weapons development effort under the Manhattan Project. In recent years, it has moved to the forefront of nuclear disarmament efforts by the nuclear-weapon states, having reduced its nuclear arsenal to the lowest levels of those five states and engaging in an internal debate over the continued salience of its nuclear weapons. **Overall Grade: B**

1. Banning Nuclear Testing: A

The United Kingdom, an Annex 2 state, signed the CTBT in 1996 and ratified the treaty in 1998.

2. Ending Fissile Material Production for Weapons: A

The United Kingdom has expressed support for negotiations on an FMCT in statements to the CD and other UN disarmament forums and in votes on resolutions in the UN General Assembly. The British government stated in 1995 that it had ceased production of HEU and weapons-grade plutonium for nuclear arms. According to statements from the British government, the United Kingdom still possesses a military stockpile comprising 3.5 metric tons of plutonium and 17.4 metric tons of HEU.[69]

3. Reducing Nuclear Weapons Alert Levels: B

The United Kingdom downgraded the alert status of its nuclear forces during the 1990s and, in 1998, limited its nuclear delivery systems to the Trident submarine-launched ballistic missile (SLBM). The British 1998 Strategic Defense Review states that the submarine-based missiles "will not be targeted and it will normally be at several days 'notice to fire'."[70] The review also stated that only one of the United Kingdom's four ballistic missile submarines, each of which carry about 48 nuclear warheads, will be on patrol at any given time.

4. Nuclear Force Reductions: D+

In December 2006, the United Kingdom declared its intention to reduce its deployed force of approximately 200 deployed strategic nuclear warheads to less than 160 and reduced its reserve stockpile by about 20 percent.[71] These reductions are believed to have left the United Kingdom with the smallest nuclear arsenal among the five NPT nuclear-weapon states.[72] On May 26, 2010, Foreign Secretary William Hague told Parliament that the United Kingdom possessed a stockpile of 225 nuclear warheads, with 160 of those "operationally available."[73]

According to British officials, the reductions announced in 2006 were completed by the end of 2007, and no reductions are believed to have been carried out during the time frame of this report.[74] In a March 2009 speech on nuclear nonproliferation, however, then-Prime Minister Gordon Brown said that London constantly reviews its stockpile levels and "[i]f it is possible to reduce the number of UK warheads further, consistent with our national deterrence and with the progress of multilateral discussions, Britain will be ready to do so."[75] The British government is currently engaged in debates over possibly replacing the Trident missile in light of their high maintenance cost, as well as potentially reducing its fleet of ballistic missile submarines from four to three.[76]

A plus (+) is added to the grade because despite the absence of formal verification measures for British nuclear arms reductions, the United Kingdom has engaged in efforts to develop verification measures for long-term nuclear reductions. Since 2007, the

Photo by Christopher Furlong/Getty Images

The British government has debated in recent years over the replacement, extension, and/or abandonment of its nuclear-armed Trident submarine program.

United Kingdom has worked with Norway, as well as the independent Verification Research, Training and Information Centre (VERTIC), to develop procedures for verifying nuclear warhead disarmament in concert with a non-nuclear-weapon state. Both countries submitted working papers on these efforts during the NPT review process, and the 2010 NPT Review Conference Final Document noted their cooperation.

5. Negative Security Assurances: C

The United Kingdom issued unilateral NSAs to non-nuclear-weapon states in 1978 and 1995, indicating that it would reserve the right to use nuclear weapons against non-nuclear-weapon states that attack the United Kingdom "in association or alliance with a nuclear-weapon state."[77] In May 2010, London announced that it would review its policy regarding the use of nuclear weapons. Upon announcing that review, Foreign Office Minister Alistair Burt said that according to British policy, "the use of nuclear weapons would only be in the most extreme circumstances of self defense following attack in certain particular circumstances."

The United Kingdom appears to leave open the possibility that it would use nuclear weapons in response to attacks using chemical or biological weapons from non-nuclear-weapon states, with British officials issuing conflicting or ambiguous statements on the matter. Speaking in regard to the use of chemical or biological weapons by Iraq, Secretary of State for Defense Geoff Hoon said in 2002 that "longstanding British government policy" maintained that "if our forces—if our people—were threatened by weapons of mass destruction we would reserve the right to use appropriate proportionate responses which might…in extreme circumstances include the use of nuclear weapons."[78] Hoon later stated that a proportionate response to the use of chemical or biological weapons by Iraq could be carried out with conventional weapons.[79]

6. Nuclear-Weapon-Free Zones: B

The United Kingdom has ratified the relevant protocols for the Latin American, South Pacific, and African NWFZs. It has not signed the protocols for the treaties of Southeast Asian and Central Asian zones.[80]

7. IAEA Safeguards: N/A

The United Kingdom has had a voluntary safeguards agreement in place with the IAEA since December 1972 and an additional protocol since April 2004.[81]

8. Nuclear Weapons-Related Export Controls: A

The United Kingdom has been a member of the NSG since its creation in 1975 and the MTCR since 1987. The United Kingdom, along with other G-8 members, has expressed the need for the NSG to adopt stricter guidelines involving the transfer of enrichment and reprocessing technology and, along with the G-8, has agreed to abide by draft criteria-based guidelines for such transfers.[82]

London has a number of national export control measures in place to prevent the spread of nuclear and missile technologies, including export control legislation, licensing provisions, deemed exports restrictions, end-user controls, and controls over re-export and transshipment. It has maintained bilateral and multilateral programs providing other states with assistance in implementing export controls.[83]

9. Nuclear Security Commitments: A

The United Kingdom has taken steps domestically and internationally to secure nuclear material. In addition to joining the CPPNM in 1992 and its amendment in 2010, the United Kingdom has endorsed the IAEA Code of Conduct. It also has an extensive regulatory system for nuclear security, overseen by the Office for Nuclear Security, including accounting, physical protection, and licensing regulations.[84] The United Kingdom has maintained ongoing programs for the dismantlement of submarines, the remediation of onshore storage sites, the management of spent nuclear fuel, and plutonium disposition.

On a multilateral basis, the United Kingdom pledged up to $750 million over 10 years as part of the G-8 Global Partnership and it participates in GTRI.[85] London has offered states assistance through the UN 1540 Committee with the implementation of that resolution, including its nuclear security provisions.[86]

10. Criminalization and Illicit Trafficking Commitments: A

The United Kingdom participates in the ITDB and ratified the Nuclear Terrorism Convention in 2009. London is a partner in the PSI and the Global Initiative to Combat Nuclear Terrorism.

United States

The United States was the first nation to test and produce nuclear weapons and is the only nation to have used nuclear weapons in war, dropping two nuclear bombs on Japan in 1945. Along with Russia, the United States built up a significant nuclear stockpile during the Cold War, peaking at a total of 31,255 weapons in 1967.[87] Since the end of the Cold War, the United States has significantly reduced its nuclear arsenal unilaterally and through bilateral arms control treaties with Russia. The United States has been a leader in global efforts to stop the arms race and the spread of nuclear weapons, spearheading efforts in the 1960s for the NPT and in the 1990s for the CTBT, among other measures. Following the collapse of the Soviet Union, Washington also spearheaded efforts to address the threat of nuclear trafficking and nuclear terrorism through cooperative threat reduction programs and broader nuclear security initiatives. **Overall Grade: B**

1. Banning Nuclear Testing: B

The United States halted nuclear testing in 1992 after carrying out a total of 1,030 nuclear test explosions. Washington led global efforts to negotiate and conclude the CTBT at the CD in 1996 and was the first nation to sign the treaty. The U.S. Senate voted to reject CTBT ratification in 1999 after a rushed and partisan debate. In 2009, President Barack Obama declared his support for Senate ratification of the treaty, but the Senate has yet to act. As an Annex 2 state, U.S. ratification is necessary for entry into force. The United States has no plans to resume nuclear testing.

2. Ending Fissile Material Production for Weapons: A

Obama pledged in 2009 to "lead a global effort to negotiate a verifiable treaty ending the production of fissile materials for weapons purposes."[88] Prior to 2009, Washington sought a multilateral ban without verification. The United States declared a halt to the production of fissile materials for nuclear weapons in 1992 and is estimated to have 250 tons of HEU and 92 tons of separated plutonium remaining in its military stockpile.[89] During the 2010 nuclear security summit, the United States signed a plutonium-disposition agreement with Russia in which both countries pledged to dispose of 34 tons of plutonium each.[90]

3. Reducing Nuclear Weapons Alert Levels: C

U.S. nuclear ballistic missile forces are reportedly ready to launch on short notice. Independent experts estimate that virtually all of the 450 Minuteman III land-based ICBMs and 96 Trident II SLBMs are on alert and ready for launch within 15 minutes.[91] Washington de-targeted its nuclear forces in 1994.

The Obama administration's April 2010 Nuclear Posture Review (NPR) concluded that "the current alert posture of U.S. strategic forces—with heavy bombers off full-time alert, nearly all ICBMs on alert, and a significant number of [ballistic missile submarines] at sea at any given time—should be maintained for the present."[92] The NPR also concluded, however, that efforts to prevent accidental or unauthorized launches and to "maximize the time available to the President to consider whether to authorize the use of nuclear weapons" should continue. It noted that such

Official White House Photo by Chuck Kennedy

Presidents Barack Obama and Dmitry Medvedev sign a preliminary agreement to further reduce their countries' strategic nuclear arsenals on July 6, 2009. The two sides concluded the New Strategic Arms Reductions, which would mandate a new ceiling of 1,550 deployed strategic warheads on no more than 700 strategic nuclear delivery systems for each country.

steps included further strengthening the command and control system and exploring ICBM basing arrangements that "enhance survivability and further reduce any incentives for prompt launch."

4. Nuclear Force Reductions: B–

The United States continued to reduce its strategic nuclear arsenal in the time frame of this report but not under formal verification measures. START reduced U.S. strategic warheads from approximately 10,000 in 1991 to 6,000 START-accountable warheads under joint U.S.-Russian verification. START reductions were completed by 2001. SORT established a limit of 2,200 operationally deployed strategic warheads each between the United States and Russia, but did not include verification provisions. Washington declared in 2009 that it reached these target reductions three years before the 2012 deadline.

Neither START nor SORT required that retired warheads to be dismantled and reductions be made irreversible. The United States currently has a backlog of thousands of excess nuclear warheads awaiting dismantlement.[93]

On April 8, 2010, the United States and Russia signed New START, which instituted a new ceiling of 1,550 accountable deployed strategic warheads for each country and a limit of 800 combined deployed and nondeployed strategic delivery systems. The agreement put in place verification measures absent since the expiration of START in December 2009. As of the publication of this report, that agreement must still be ratified by the legislatures of the two countries.

A minus (–) is added to the grade because SORT did not include verification provisions. When START expired on Dec. 5, 2009, nuclear reductions were no longer subject to formal verification requirements. New START will replaced SORT when it enters into force, and formal verification measures will be resumed.

5. Negative Security Assurances: B

The United States issued assurances not to use nuclear weapons against non-nuclear-weapon-state NPT members in 1978 and 1995 except in the case of an attack "in association or alliance with a nuclear-weapon state."[94] In 1997 the United States issued a Presidential Decision Directive reaffirming these pledges.

In its 2010 NPR, the United States revised its policy of reserving the right to use nuclear weapons to deter chemical and biological weapons threats, stating instead that "the United States is now prepared to strengthen its long-standing 'negative security assurance' by declaring that the United States will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations."[95] This declaration effectively removes

the caveats to previous U.S. NSAs that may have left non-nuclear-weapon states believed to possess or to be seeking chemical weapons open to possible nuclear weapons use.

Despite the strengthening of U.S. NSAs, the NPR indicates that Washington may revise its NSA pledge in the face of biological weapons threats, stating that "the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of the biological weapons threat and U.S. capacities to counter that threat."[96]

6. Nuclear-Weapon-Free Zones: C

The United States has ratified the relevant protocol to the Latin American NWFZ, but has only signed the protocols for the treaties of the African and South Pacific zones. It has not signed the protocols for the Southeast Asian and Central Asian zones.

The United States announced at the 2010 NPT Review Conference that it would seek the ratification of the protocols to the African and South Pacific NWFZs.[97] Washington also declared that it would carry out consultations with the parties to the Southeast Asian and Central Asian NWFZ treaties to explore the possibility of signing and ratifying those accords.

7. IAEA Safeguards: N/A

The United States has had a voluntary safeguards agreement in place with the IAEA since December 1980 and an additional protocol since January 2009.[98]

8. Nuclear Weapons-Related Export Controls: A

The United States was a founding a member of the NSG and the MTCR. It has agreed to G-8 commitments not to transfer reprocessing and enrichment technologies to non-NPT states.

The United States has an extensive export control assistance program aiding the development of nuclear weapons-related export controls in other states, including the Export Control and Related Border Security program, a Department of State-led interagency program aimed at export control assistance in about 40 countries.

A 2007 action plan submitted to the 1540 Committee focused on assistance efforts to help states implement the resolution, including nuclear-related export control measures.[99]

U.S. Navy photo by Mass Communication Specialist 2nd Class Seth Clarke

U.S. Navy and U.S. Coast Guard personnel perform a mock boarding as part of the multi-state Proliferation Security Initiative (PSI) exercise Deep Sabre II Oct. 29, 2009. The United States launched PSI, which now includes over 90 participants, in 2003 to coordinate efforts to detect and interdict the illicit trafficking of weapons of mass destruction (WMD) and related materials.

9. Nuclear Security Commitments: B+

Washington joined the CPPNM in 1982 and implements extensive national nuclear security regulations overseen by the Nuclear Regulatory Commission and the National Nuclear Security Administration (NNSA). Regulations cover accounting and security for the use, storage, and production of nuclear material, physical protection for facilities and material, and licensing for entities and facilities.[100] The United States has agreed to implement nuclear security procedures consistent with the IAEA Code of Conduct.

The United States is actively involved in global efforts to secure nuclear materials. In April 2010, it hosted a nuclear security summit in which 47 nations committed to securing nuclear material around the world in four years. Washington discourages the civilian use of HEU and civil reprocessing, contributes to the IAEA's Nuclear Security Fund, and pledged $10 billion in funding under the G-8 Global Partnership, including for nuclear security programs. In 2004, Washington launched the GTRI, aimed at preventing the illicit acquisition of nuclear and radiological material.

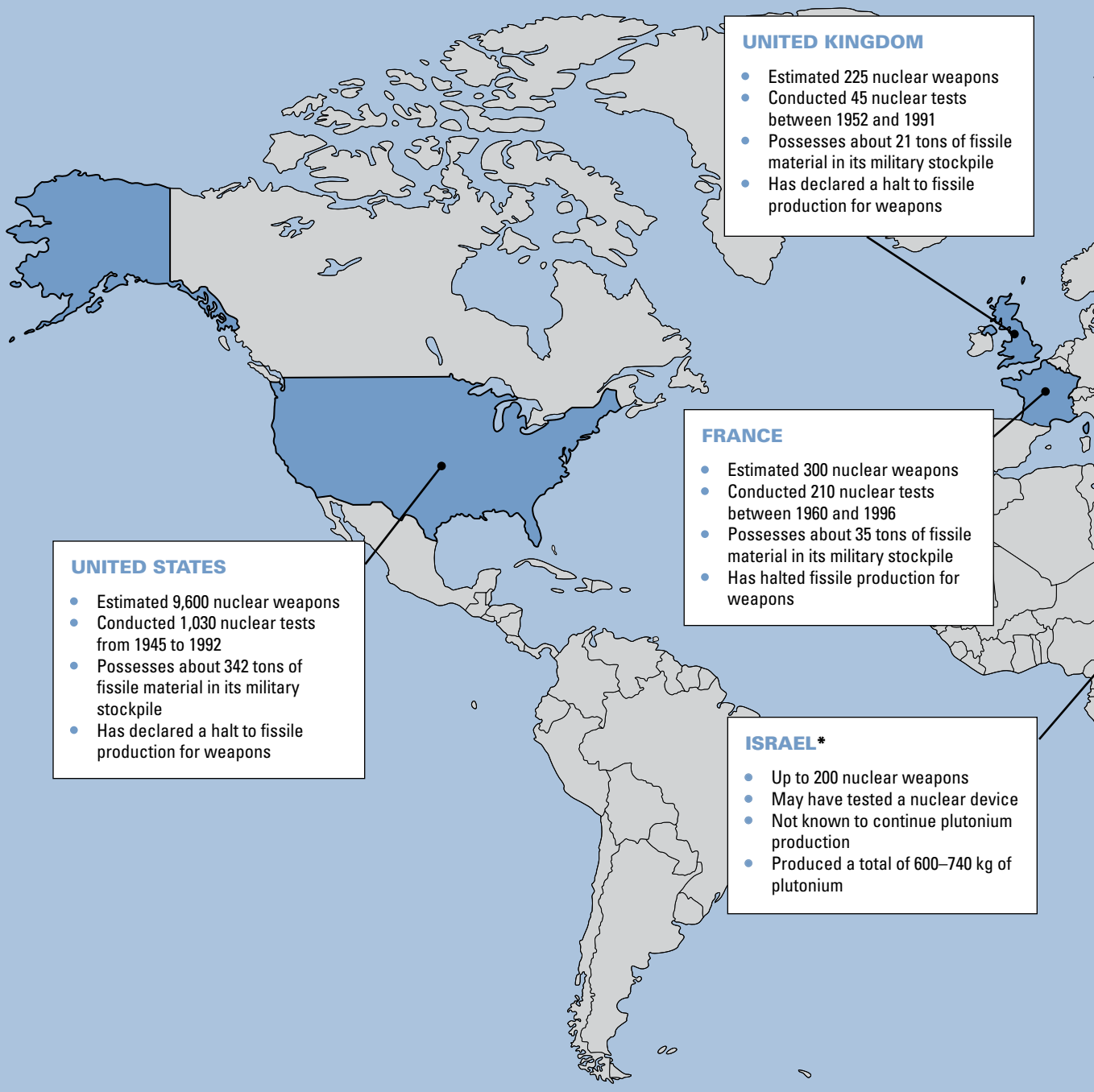
A plus (+) is added to the grade because in September 2008, the Senate provided advice and consent to ratify the CPPNM amendment, and the Obama administration submitted implementing legislation to the Senate Judiciary Committee in 2010, paving the way for completing the ratification process.[101]

10. Criminalization and Illicit Trafficking Commitments: B+

The United States participates in the ITDB and has initiated or joined a number of multilateral efforts to prevent or counter illicit trafficking in nuclear materials, including the PSI and the Global Initiative to Combat Nuclear Terrorism.

A plus (+) is added to the grade because the United States signed the Nuclear Terrorism Convention in September 2005. The Senate gave its advice and consent to ratify the convention in September 2008, but has yet to approve implementing legislation for the accord.

Key Figures for 11 Select States



UNITED KINGDOM

- Estimated 225 nuclear weapons
- Conducted 45 nuclear tests between 1952 and 1991
- Possesses about 21 tons of fissile material in its military stockpile
- Has declared a halt to fissile production for weapons

FRANCE

- Estimated 300 nuclear weapons
- Conducted 210 nuclear tests between 1960 and 1996
- Possesses about 35 tons of fissile material in its military stockpile
- Has halted fissile production for weapons

UNITED STATES

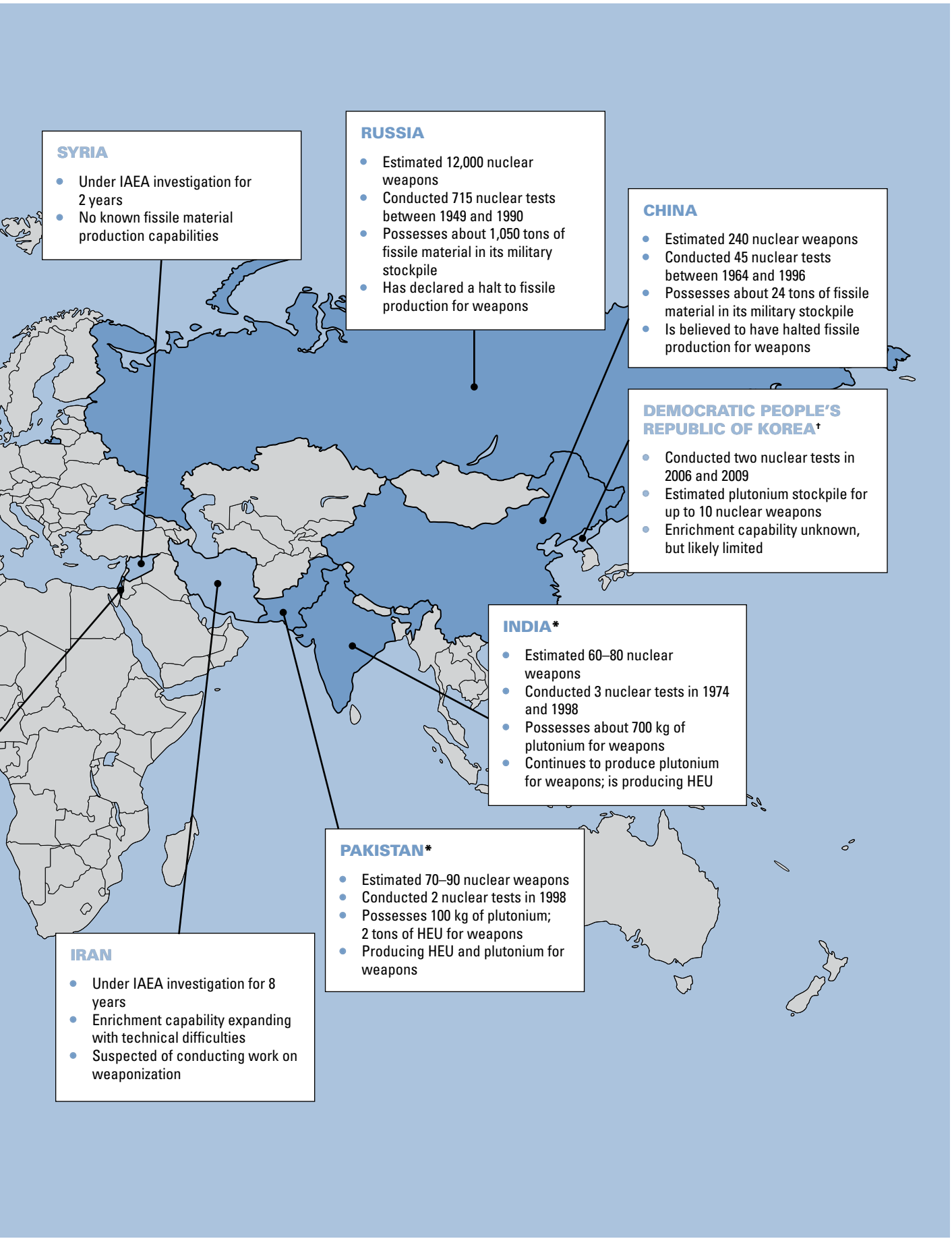
- Estimated 9,600 nuclear weapons
- Conducted 1,030 nuclear tests from 1945 to 1992
- Possesses about 342 tons of fissile material in its military stockpile
- Has declared a halt to fissile production for weapons

ISRAEL*

- Up to 200 nuclear weapons
- May have tested a nuclear device
- Not known to continue plutonium production
- Produced a total of 600–740 kg of plutonium

* Has not signed the NPT

† Announced withdrawal from NPT in 2003


SYRIA
Under IAEA investigation for 2 years
No known fissile material production capabilities
RUSSIA
Estimated 12,000 nuclear weapons
Conducted 715 nuclear tests between 1949 and 1990
Possesses about 1,050 tons of fissile material in its military stockpile
Has declared a halt to fissile production for weapons
CHINA
Estimated 240 nuclear weapons
Conducted 45 nuclear tests between 1964 and 1996
Possesses about 24 tons of fissile material in its military stockpile
Is believed to have halted fissile production for weapons
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA†
Conducted two nuclear tests in 2006 and 2009
Estimated plutonium stockpile for up to 10 nuclear weapons
Enrichment capability unknown, but likely limited
INDIA*
Estimated 60–80 nuclear weapons
Conducted 3 nuclear tests in 1974 and 1998
Possesses about 700 kg of plutonium for weapons
Continues to produce plutonium for weapons; is producing HEU
PAKISTAN*
Estimated 70–90 nuclear weapons
Conducted 2 nuclear tests in 1998
Possesses 100 kg of plutonium; 2 tons of HEU for weapons
Producing HEU and plutonium for weapons
IRAN
Under IAEA investigation for 8 years
Enrichment capability expanding with technical difficulties
Suspected of conducting work on weaponization

NON-NPT STATES

India

India has developed a nuclear arsenal outside the NPT, carrying out its first nuclear test in 1974 but not formally declaring a nuclear weapons capability until further tests in 1998. Despite long-standing calls from New Delhi for global nuclear disarmament, India rejects the current nonproliferation regime as inherently discriminatory and has been resistant to join multilateral disarmament efforts. In 2008 the NSG agreed to exempt India from rules restricting commercial nuclear cooperation to non-NPT members, allowing India to take advantage of a key NPT incentive despite remaining outside the treaty.

Overall Grade: C+

1. Banning Nuclear Testing: D+

India has not signed the CTBT, and in 1996 it took part in blocking the adoption of the CTBT in the CD.[102] India was also one of the three countries that abstained on the 2009 UN General Assembly resolution supporting the CTBT entry into force. Following the 1998 South Asian nuclear test explosions, the UN Security Council in Resolution 1172 demanded that India and Pakistan refrain from further nuclear tests.

A plus (+) is added to the grade because New Delhi declared a testing moratorium in September 1998 following a series of nuclear weapons tests it conducted in May of that year. On Sept. 5, 2008, Indian External Affairs Minister Pranab Mukherjee reiterated India's commitment to "a voluntary unilateral moratorium on nuclear testing." If India resumed testing, it would likely jeopardize its nuclear cooperation with other countries. Following the NSG agreement to exempt India from restrictions on nuclear trade with non-NPT states, many countries issued statements indicating that such trade would halt if India were to conduct a nuclear test. U.S. law requires that nuclear trade with India cease in the event of a test.[103]

2. Ending Fissile Material Production for Weapons: F

New Delhi has expressed support for negotiating an FMCT, but it has rejected a voluntary moratorium on fissile material production for weapons.[104] In May 2009, Indian permanent representative to the CD Nirupama Rao said that New Delhi would allow multilateral talks to begin, but would "not accept obligations" that hinder India's "strategic program" or research and development or those that "place an undue burden on our military non-proscribed activities."[105] As per the terms of the U.S.-Indian nuclear cooperation agreement, India has agreed to "working with the United States for the conclusion of a multilateral Fissile Material Cut-off Treaty."[106] It is unclear what cooperation this pledge has yielded.

India is believed to be capable of producing about 30 kilograms of weapons-grade plutonium each year.[107] In the coming years, however, India is expected to shut down its CIRUS reactor and start up its Prototype Fast Breeder Reactor, thereby increasing plutonium production to about 167 kilograms per year.[108] Although India is known to produce HEU for naval reactors, it is unknown whether it does so for nuclear weapons. Independent satellite imagery analysis in March 2010 assessed that India was significantly expanding its military uranium-enrichment capacity.[109]

3. Reducing Nuclear Weapons Alert Levels: A

India's land-based missiles are not believed to be mated with their nuclear warheads, effectively reducing their readiness level and the risk of accidental or unauthorized use.[110] India's delivery

Petr Pavlicek/IAEA

India's Fast-Breeder Test Reactor at the Kalpakkam Nuclear Complex. Breeder reactors are so-named because they can produce more fissile material than they consume and India is poised to dramatically scale-up the rate at which it produces plutonium for nuclear weapons.

systems comprise two legs of a nuclear triad, land-based nuclear-capable missiles and nuclear-capable aircraft, with a sea-based leg currently in development. In 2003, India established its Nuclear Command Authority to exercise command and control over its nuclear arsenal.

New Delhi annually sponsors a UN General Assembly resolution that calls for de-altering and de-targeting nuclear weapons.[111]

4. Nuclear Force Reductions: F

India continues to expand the size of its nuclear arsenal and its nuclear delivery capabilities. In 2007, then-Defense Minister Shri A.K. Antony said that the size of India's nuclear arsenal would be "commensurate with the size and geostrategic position of India in the world."[112]

India has continued to develop more-capable land-based missiles, including the intermediate-range Agni III ballistic missile, and is working on sea-launched ballistic and cruise missiles.[113]

5. Negative Security Assurances: B+

India maintains a policy of the "non-use" of nuclear weapons against non-nuclear-weapon states.[114]

A plus (+) is added to the grade because, as stated in India's 1999 nuclear doctrine, "India will not be the first to initiate a nuclear strike, but will respond with punitive retaliation should deterrence fail."[115]

Although officially India has adopted a no-first-use policy, some Indian strategists have called the pledge's validity into question.[116] The credibility of this pledge was weakened in 2009 when Indian Army Chief Gen. Deepak Kapoor suggested the government should review the pledge in light of the growing threat of Pakistan.[117] This does not appear to diminish the NSA effect of India's policy vis-à-vis non-nuclear-weapon states.

6. Nuclear-Weapon-Free Zones: C–

India has voted in support of UN General Assembly resolutions calling for the establishment of NWFZs in other regions.

A minus (–) is added to the grade because India has consistently voted against UN measures supporting an NWFZ in South Asia.[118] Since 1974, the UN General Assembly has adopted resolutions supporting the creation of a NWFZ in the region.

7. IAEA Safeguards: C+

India has a limited INFCIRC/66-type agreement in force with the IAEA covering some of its civilian nuclear facilities. In 2008 the IAEA Board of Governors approved an "India-specific" safeguards agreement, which extended these safeguards to cover 14 civilian reactors.[119]

A plus (+) is added to the grade because the IAEA approved an additional protocol for India in March 2009.[120] Although India's additional protocol is based on the 1997 Model Additional Protocol, it does not include a number of reporting requirements otherwise contained in the model protocol. India agreed to reporting only nuclear-related exports, excluding reporting on nuclear-related imports, uranium mining, and nuclear fuel-cycle-related research and development.[121] The IAEA also does not have complementary access to Indian facilities to inspect undeclared sites.

8. Nuclear Weapons-Related Export Controls: A–

India pledged in July 2005 to adhere to NSG and MTCR guidelines as part of a proposed U.S.-Indian nuclear cooperation agreement.[122] New Delhi is believed to have harmonized its national export controls with those regimes "up through the 2005 revisions," with the potential for further updates.[123]

India's national export controls include provisions related to export licensing, import controls, and end-user controls.[124]

A minus (–) is added to the grade because independent assessments suggest that Indian nuclear procurement efforts for dual-use goods have violated the export control laws of other countries and have been contrary to the spirit of the NSG.[125] These goods, in particular tributyl phosphate, do not fall under NSG control lists, but are subject to the catch-all provisions of some export control laws. According to the independent assessments, Indian trading companies did not disclose the real end user of the goods acquired in their procurement efforts. The extent to which these imports have continued is uncertain.

9. Nuclear Security Commitments: A

India acceded to the CPPNM in 2002 and ratified its amendment in 2007.

Also, India has undertaken a number of national nuclear security measures consistent with the requirements of UN Security Council Resolution 1540. These steps include the establishment of a nuclear regulatory authority, accounting measures for nuclear material, and a licensing procedure for nuclear facilities and materials. India is implementing the IAEA Code of Conduct.[126] New Delhi is a GTRI participant. During the 2010 nuclear security summit, India announced the creation of a Nuclear Energy Center with a nuclear security component.[127]

10. Criminalization and Illicit Trafficking Commitments: A

India participates in the ITDB, joined the Nuclear Terrorism Convention in 2006, and is a partner nation in the Global Initiative to Combat Nuclear Terrorism.

NON-NPT STATES

Israel

Israel is widely believed to possess an undeclared nuclear arsenal of up to 200 nuclear weapons. One of three states never to sign the NPT, Israel has maintained a policy of nuclear ambiguity since the 1960s, declaring that it will not be "the first country to introduce nuclear weapons into the region."[128] Its position on a wide variety of disarmament measures is that regional security conditions must first improve before it can take certain practical disarmament steps. Israel's participation in a number of key international nonproliferation measures has therefore been somewhat limited. **Overall Grade: C–**

1. Banning Nuclear Testing: C

Israel has signed but not ratified the CTBT. As an Annex 2 state, Israel's ratification is necessary for the entry into force of the treaty. Although the country has expressed its support for the treaty as an important aspect of the nuclear nonproliferation regime, Israel has linked its full membership in the CTBT to the security environment in the region. At a 2009 conference of signatories to the CTBT, Israel argued that, "in recent years, the international community has witnessed growing threats and challenges to the non-proliferation regime from within the Middle East region besides alarming calls by some in the region against the very existence of the State of Israel."[129]

Israel's claim that it shall not be the state that introduces nuclear weapons to the region does serve as a de facto moratorium on nuclear testing.

2. Ending Fissile Material Production for Weapons: F

Israel has expressed concern that an FMCT would not be an adequate safeguard against Iran's development of nuclear weapons.[130] Yet, it has not blocked consensus in the CD to move forward on negotiating such a treaty and did not oppose a December 2009 UN General Assembly consensus resolution urging the CD to start FMCT negotiations in 2010.

It is unclear if Israel continues to produce fissile materials at its Dimona reactor, but under its policy of nuclear ambiguity, it has not declared a cessation to such production for weapons purposes. As of 2009, it is estimated that Israel has produced 600 to 740 kilograms of weapons-grade plutonium total.[131]

3. Reducing Nuclear Weapons Alert Levels: D+

Israel does not acknowledge its possession of nuclear weapons and therefore has not provided transparency regarding the command and control structure of its nuclear forces or other assurances against unauthorized use. Israel abstained in UN General Assembly votes on resolutions calling for decreasing the readiness of nuclear forces.[132]

A plus (+) is added to the grade because Israel is believed to maintain its nuclear weapons de-mated from their delivery systems, and may store them in a disassembled state.[133] Israeli delivery vehicles include land- and sea-based nuclear-capable ballistic and cruise missiles as well as air-delivered gravity bombs.[134]

4. Nuclear Force Reductions: D

Israel is suspected to have maintained its arsenal of up to 200 weapons; there has been no indication that it has made reductions.[135]

Israel has continued to abstain from annual UN General Assembly resolutions concerning nuclear disarmament, such as those introduced by Japan, the New Agenda Coalition, and the Nonaligned Movement.[136]

5. Negative Security Assurances: D+

Because Israel has not acknowledged possession of nuclear weapons, it has not made any statements regarding its willingness to use nuclear weapons against non-nuclear-weapon states.

A plus (+) is added to the grade because Israel's position that it will not be the first state to introduce nuclear weapons in the region can be interpreted as a de facto pledge not to use them against non-nuclear-weapon states.

6. Nuclear-Weapon-Free Zones: C–

As the only state in the region in possession of nuclear weapons, Israel's cooperation is integral to the prospect of establishing a WMD-free zone in the region, as called for in the 1995 Resolution on the Middle East. Israel has issued statements in support of creating such a zone and has voted in favor of UN General Assembly resolutions to that effect, but it continues to maintain that the political and security environment in the region must change before such a restriction could take effect.[137]

A minus (–) is added to the grade because, in response to the reaffirmation in the 2010 NPT Review Conference Final Document of "the importance of Israel's accession" to the NPT and the placement of its nuclear facilities under safeguards, Israel declared that it would not participate in steps agreed at the conference toward establishing a WMD-free zone in the Middle East.[138] A statement issued by the office of Israeli Prime Minister Benjamin Netanyahu said that the agreement "singles out Israel, the Middle East's only true democracy and the only country threatened with annihilation."[139] The NPT states-parties agreed on a conference of states in the Middle East in 2012 to discuss the creation of such a zone and on consultations to prepare for such a conference in the interim.

7. IAEA Safeguards: C

Select Israeli nuclear facilities are governed under a limited INFCIRC/66-type agreement, rather than a full-scope IAEA safeguards arrangement. Its Dimona nuclear complex, thought to be the location of Israel's nuclear weapons program, is not included in this agreement. The IAEA issues an annual Safeguards Implementation Report that details the achievements and developments of the safeguards arrangement.

Amn Josie L. Kemp, USAF

Israeli Air Force and U.S. Air Force personnel with an Israeli F-15 fighter at Lajes Field, Azores, Portugal. Israeli F-15s serve as one of the delivery systems for Israel's nuclear weapons, which also include land- and sea-based ballistic and cruise missiles.

The latest annual IAEA report on safeguards implementation, for 2008, indicates that Israel is in compliance with its safeguards agreement.[140]

In September 2009, the IAEA General Conference adopted a resolution expressing concern over the lack of safeguards at Israeli nuclear facilities, while calling on the country to join the NPT and adhere to comprehensive safeguards. The resolution was adopted with 49 votes in favor, 45 against, and 16 abstentions.[141]

8. Nuclear Weapons-Related Export Controls: A

Israel has agreed to adhere to NSG guidelines with respect to nuclear transfers. An Israeli Atomic Energy Commission release dated May 14, 2009, highlights Israel's continuing compliance with NSG guidelines, as well as "ways to enhance the ongoing dialogue between Israel and the NSG in light of Israel's adherence to the NSG."[142] Israel pledged in October 1992 to abide by MTCR guidelines.

In its 2004 report to the 1540 Committee, Israel noted a number of national measures to control the spread of nuclear weapons-related and delivery vehicle technologies, including export control legislation, licensing provisions, import controls, and a catchall clause.[143]

9. Nuclear Security Commitments: B

Israel joined the CPPNM in January 2002 and has endorsed the IAEA Code of Conduct. The Israeli Atomic Energy Commission has some nuclear regulatory responsibilities.[144] Israel is a participant in the GTRI.

10. Criminalization and Illicit Trafficking Commitments: B+

Israel participates in the ITDB, as well as the Global Initiative to Combat Nuclear Terrorism and the PSI.

A plus (+) is added to the grade because Israel signed the Nuclear Terrorism Convention in 2006.

NON-NPT STATES

Pakistan

Pakistan never signed the NPT and began a concerted drive to develop nuclear weapons in the early 1970s in response to rival India's activities. As nuclear suppliers began to oppose transfers of sensitive nuclear technologies to the country, Islamabad relied heavily on smuggled uranium-enrichment technology acquired by nuclear official Abdul Qadeer Khan. By the 1980s, when Pakistan had acquired sufficient expertise in uranium enrichment, Khan and his smuggling network shared that technology with a number of other countries, including Iran, Libya, and North Korea, likely with some involvement by the Pakistani government and/or military. More recently, violent political struggles in Pakistan have raised serious concerns regarding the security of its nuclear arsenal and facilities, escalating the risk that militants may acquire nuclear material or a nuclear device. **Overall Grade: C–**

1. Banning Nuclear Testing: D+

Pakistan has not signed the CTBT, and in 2009, Pakistani officials ruled out signing the treaty due to its security situation with India. Pakistani Foreign Ministry Spokesman Abdul Basit told reporters in June 2009, "Let me tell you, Pakistan has no plan to sign the CTBT," adding that circumstances have changed since Islamabad pledged in 1998 to sign the agreement if nuclear rival India did the same.[145] Following the 1998 South Asian nuclear test explosions, the UN Security Council in Resolution 1172 demanded that Pakistan and India refrain from further nuclear tests.

A plus (+) is added to the grade because Islamabad declared a test moratorium following a series of nuclear tests conducted in 1998.

2. Ending Fissile Material Production for Weapons: F

Pakistan continues to produce fissile material for nuclear weapons and has expressed concern that limitations on its ability to do so would essentially freeze the asymmetry between its fissile material stores and that of India, leaving it at a permanent disadvantage.[146] Pakistan has argued that a 2008 NSG exemption for nuclear cooperation with India will increase that disadvantage.

An October 2009 Congressional Research Service report claims Pakistan "continues to produce HEU for weapons at a rate of at least 100 kilograms per year." Pakistan is constructing two additional heavy-water reactors that will "expand considerably Pakistan's plutonium production capacity."[147] Independent assessments suggest that one of those reactors began operations in late 2009.[148]

Pakistan has hindered efforts by the CD to break its long-standing deadlock and start work to negotiate an FMCT. Although Islamabad initially joined the consensus on a program of work in May 2009, it broke consensus that August by refusing to agree to the implementation framework for the program of work. Pakistan cited a number of procedural concerns and argued that "balanced progress" must be made on the CD's four core issues.[149]

3. Reducing Nuclear Weapons Alert Levels: A

Pakistan's nuclear warheads are believed to be stored in a disassembled state, with the fissile core kept separate from the warhead package.[150] Pakistani officials maintain that its nuclear weapons are equipped with permissive action links and require at least two people to authorize their use.[151]

Pakistan has a three-tired command and control structure overseeing its nuclear weapons establishment, which was formalized by the "National Command Authority Ordinance, 2007," by then-President Gen. Pervez Musharraf.[152] Islamabad's National Command Authority has the primary responsibility for nuclear weapons development and deployment, including operational planning and control.

4. Nuclear Force Reductions: F

The increasing scale of Pakistan's fissile material production capacity enhances its ability to expand the size of its nuclear arsenal. In March 2009, Defense Intelligence Agency Director Michael Maples told the Senate Armed Services Committee that "Pakistan continues to develop its nuclear infrastructure, expand nuclear weapon stockpiles and seek more advanced warheads and delivery systems."[153] In particular, Pakistan has continued to develop ballistic and cruise missile capabilities.[154]

5. Negative Security Assurances: B

Pakistan has pledged no first use against non-nuclear-weapon states, but has not ruled out first use against India.[155] In 2008, however, Pakistani President Asif Ali Zadari said that Islamabad would not use nuclear weapons first against India.[156] It is unclear if this statement reflects current Pakistani nuclear doctrine.

6. Nuclear-Weapon-Free Zones: C–

Islamabad has generally supported the establishment of NWFZs, having voted in favor of resolutions supporting their creation in various regions.

A minus (–) is added to the grade because Pakistan has voted against references supporting such a zone in South Asia.[157] Since 1974, the UN General Assembly has adopted resolutions supporting the creation of a NWFZ in the region.

Pakistan's objection to resolutions supporting a NWFZ in the region appears at odds with Zadari's claim that he has asked India to join Pakistan in

Official White House Photo by Pete Souza

Pakistani Prime Minister Yousaf Raza Gilani with President Barack Obama during the Nuclear Security Summit. Political instability in Pakistan in recent years has raised concerns regarding the security of Pakistani nuclear arms, facilities, and materials.

establishing a nuclear-free South Asia. In a 2008 interview, Zadari said, "I am willing to assure the world through—on behalf of my parliament, that if India comes with us, we can together jointly sign a free of…a nuclear-free South Asia."[158]

7. IAEA Safeguards: C

Currently, only select Pakistani civilian nuclear facilities are governed under a limited-scope IAEA safeguards arrangement, which includes the Karachi Nuclear Power Plant and the Chashma Nuclear Power Plant.[159]

8. Nuclear Weapons-Related Export Controls: F

Pakistan is suspected of maintaining an illicit procurement network for goods and technologies for its nuclear and missile programs. Case studies provided by the French National Directorate of Customs Intelligence and Investigations to the Financial Action Task Force for a June 2008 report on proliferation financing detail efforts by Pakistani Department of Defense and associated entities to illegally acquire equipment for missiles and unmanned aerial vehicles.[160] Pakistani trading companies are also believed to be involved in illicit efforts to acquire components for Islamabad's uranium-enrichment program.[161]

Although Pakistan has continued to procure goods in violation of export controls in other states, it has taken steps to establish its own national export control system in recent years.[162] These steps include export control legislation developed in 2004 covering export, re-exports, and transshipment; national controls lists consistent with those of the NSG and MTCR; and a licensing body responsible for control list implementation and export control law enforcement.

Many of these steps were taken to adhere to Resolution 1540 and followed revelations regarding the nuclear smuggling network run by Khan.[163]

9. Nuclear Security Commitments: A*

Pakistan acceded to the CPPNM in 2000. In addition, Pakistan has undertaken a number of measures in recent years to secure nuclear materials. In its 2004 report to the 1540 Committee, Pakistan indicates the "Pakistan Nuclear Regulatory Authority (PNRA) has established a system for the safety and security of nuclear and radioactive materials and installations during use, storage and transport." The PNRA also addresses the licensing of nuclear facilities and entities. Islamabad has agreed to follow the guidelines of the IAEA Code of Conduct. Pakistan participates in the GTRI.

An asterisk (*) is added to the grade because in 2009, severe political instability in Pakistan stemming from the actions of the Taliban and other extremists significantly raised international concerns regarding nuclear security in the country, including that of its nuclear arsenal. Pakistani officials continue to maintain that Pakistan's arsenal is secure and that they are prepared to deal with any contingency.[164] This report does not intend to address whether Pakistani nuclear security measures are sufficient to address its internal threats, but rather whether Islamabad has undertaken commitments to adhere to global standards on nuclear security.

Because of these concerns, physical security has improved in the recent years, due in significant part to U.S. assistance across a spectrum of activities. This assistance includes the development of nuclear material accountability and tracking programs, advanced training by U.S. national laboratories, and the development of personnel reliability and accounting measures. Cooperation has been limited by speculation over U.S. contingency plans designed to secure Pakistani nuclear weapons in a crisis.[165]

Pakistan also has relied extensively on a strategy of secrecy to protect its nuclear arsenal from unauthorized access, an approach that has come under some criticism because of the increased risk of insider collusion.[166]

10. Criminalization and Illicit Trafficking Commitments: B

Pakistan participates in the ITDB and the Global Initiative to Combat Nuclear Terrorism.

Democratic People's Republic of Korea

The only state to have declared its withdrawal from the NPT, North Korea has been a focal point for nuclear nonproliferation efforts for nearly 20 years. After IAEA inspectors found North Korea to be cheating on its nonproliferation obligations in the 1990s, the United States entered into a bilateral agreement that froze much of the North's nuclear activities but was unsuccessful in turning back the program. Following the collapse of that agreement in 2002, North Korea developed an overt nuclear weapons capability, having now tested two nuclear devices. The six-party talks framework was established in 2003 to address the nuclear issue, and that process has been replete with periods of crisis, stalemate, and tentative progress toward denuclearization. The UN Security Council also has sought to place pressure on North Korea regarding its proliferation activities, adopting two sets of sanctions in response to its 2006 and 2009 nuclear tests.[167] In addition to its own nuclear weapons efforts, North Korea has been a key supplier of nuclear weapons-related and missile technologies to other states, increasing proliferation threats in South and Southeast Asia and the Middle East. **Overall Grade: F**

1. Banning Nuclear Testing: F

Pyongyang has not signed the CTBT and tested a nuclear weapon in May 2009. North Korea is the only country to have conducted nuclear tests in the past 12 years, carrying out its first in 2006. Pyongyang also has left open the possibility that it will test additional nuclear devices.[168] North Korea was the sole country to vote against a 2009 UN General Assembly resolution supporting the CTBT's entry into force.

2. Ending Fissile Material Production for Weapons: F

Although North Korea voted to move forward with a CD agenda, including discussions on an FMCT, it declared that it would restart plutonium production in response to UN condemnation of its missile tests in April 2009.[169] In November of that year, North

Photo by GlobalSecurity.org/Getty Images

North Korea's Yongbyon nuclear complex is the site of key nuclear facilities involved in its nuclear weapons program. Although Pyongyang's five megawatt nuclear reactor is not believed to have restarted since 2007, it has produced enough plutonium for an estimated 12 nuclear weapons.

Korea announced that it was in the final stages of reprocessing 8,000 rods of plutonium it unloaded from its nuclear reactor in Yongbyon, enough for one or two additional nuclear weapons.[170] North Korea also declared that it is pursuing a uranium-enrichment program, but the status of that program is unclear.

3. Reducing Nuclear Weapons Alert Levels: D

North Korea claims that it has weaponized all of its plutonium, but it is unclear if it has nuclear weapons in a deliverable form. The U.S. Defense Intelligence Agency assesses that North Korea may be capable of mating a nuclear warhead with a ballistic missile.[171] It remains unclear in what status Pyongyang's nuclear devices would be maintained, or what procedures are in place to prevent their unauthorized use.

4. Nuclear Force Reduction: F

North Korea has declared that it would continue to enhance its nuclear weapons capabilities. In November 2009, North Korean state media announced that Pyongyang had finished reprocessing spent fuel from its reactor "for the purpose of bolstering up" its nuclear arsenal.[172]

5. Negative Security Assurances: F

Although North Korea generally refers to its nuclear weapons capabilities as a deterrent, it has threatened to use nuclear weapons against suggested threats, including against South Korea, a non-nuclear-weapon state.[173] These threats are often made in response to annual U.S.-South Korean joint military exercises.

6. Nuclear-Weapon-Free Zones: F

In 1992, Pyongyang and Seoul issued the Joint Declaration on the Denuclearization of the Korean Peninsula, declaring that neither state would test, manufacture, possess, or use nuclear weapons, establishing in essence an NWFZ on the peninsula.[174] The declaration also stated that both countries would use nuclear power solely for peaceful purposes and would not possess nuclear reprocessing and uranium-enrichment facilities. Pyongyang has since maintained or developed reprocessing and enrichment capabilities and nuclear weapons and remains in violation of that agreement.

North Korea has occasionally supported UN General Assembly resolutions on various NWFZs.[175]

7. IAEA Safeguards: F

North Korea has not had comprehensive IAEA safeguards in place since 1994, when it withdrew from agency membership after failing to cooperate with a special inspection.[176] The IAEA maintains that North Korea is still bound by its safeguards agreement despite North Korea's insistence otherwise. Agency inspectors were briefly allowed to monitor the shutdown of North Korea's key nuclear facilities during two separate denuclearization agreements, but were ejected when negotiations collapsed.[177]

8. Nuclear Weapons-Related Export Controls: F

North Korea is not a member of the NSG or MTCR and is considered one of the most active proliferators of nuclear and missile technology. The U.S. intelligence community assesses that North Korea has provided extensive nuclear assistance to Syria and continues to export ballistic missiles and associated materials to several countries, including Iran and Pakistan.[178]

North Korea has not submitted a report to the 1540 Committee and is currently facing sanctions resulting from its nuclear tests in 2006 and 2009. The UN Security Council unanimously adopted Resolution 1874 in 2009, which strengthened the existing arms embargo, called for the inspection of cargo vessels thought to be carrying prohibited items, and instituted new financial sanctions.[179]

9. Nuclear Security Commitments: D

North Korea is not known to have adopted any nuclear material security measures consistent with Resolution 1540. It is not a participant in any international nuclear security initiatives.

10. Criminalization and Illicit Trafficking Commitments: D

North Korea is a key nuclear trafficking concern and is not known to have enacted any measures to address the issue.

Iran

Iran has been a major international concern for nuclear proliferation since the existence of previously undeclared nuclear activities were revealed in the fall of 2002. The IAEA has continued to press Iran for clarification regarding the history of those activities, which span about 18 years, and has sought to enhance its monitoring capabilities in the country, including calling on Tehran to ratify and implement an additional protocol. The IAEA Board of Governors referred Iran's nuclear file to the UN Security Council in 2006. Since that time, the council has adopted four increasingly severe sanctions resolutions in response to Iran's failure to meet the council's demand to suspend uranium enrichment.[180] In addition to concerns about Iran's enrichment program, the IAEA has expressed concern that Tehran has engaged in activities relevant to the development of a nuclear warhead and has unsuccessfully sought answers from Iran regarding these suspicions. **Overall Grade: D**

1. Banning Nuclear Testing: B–

As an Annex 2 state, Iran's ratification is required for the CTBT's entry into force. Tehran signed the treaty in 1996, but has yet to ratify it. After signing, Iran issued a number of declarations criticizing certain aspects of it, in particular Israel's inclusion in the Middle East and South Asian (MESA) regional grouping.[181] Tehran said that this inclusion "will impede the implementation of the Treaty, as the confrontation of the States in this regional group would make it tremendously difficult for the Executive Council to form."[182]

Although Iran has generally participated in the CTBT's biennial entry-into-force conferences and expressed support for the treaty, its statements to the conference have not indicted any steps by Tehran to ratify it. Rather, Iran has stated that the nuclear-weapon states bear "the main responsibility" for the treaty's entry into force and insisted that Annex 2 states that are non-NPT parties must accede to that treaty in order to make progress on the CTBT.[183]

A minus (–) is added to the grade because Iran's commitment to the CTBT has come into question in recent years, as concerns have been raised that Iran has carried out studies related to testing a nuclear device. Documentation under investigation by the IAEA as part of the alleged studies on nuclear weapons development by Iran included a diagram for an underground test site consistent with a nuclear weapons test.[184] Iran claims that the documentation has been fabricated.

2. Ending Fissile Material Production for Weapons: N/A

3. Reducing Nuclear Weapons Alert Levels: N/A

4. Nuclear Force Reductions: N/A

5. Negative Security Assurances: N/A

6. Nuclear-Weapon-Free Zones: C–

Iran under the shah was the first country to propose the creation of an NWFZ in the Middle East, and that has been a key international nonproliferation goal since that proposal in 1974.[185] Tehran has continued

Photo by Majid Saeedi/Getty Images

Iran's uranium enrichment facility at Natanz has been the focus of international concern since the existence of the facility was publicly revealed in 2002. Iran has failed to fully cooperate with an IAEA investigation into its past and present nuclear activities.

to call for the establishment of such a zone and has supported the adoption of the relevant resolution in the UN General Assembly. It has also supported resolutions pertaining to NWFZs in other regions.

(-) However, suspicions of an Iranian nuclear weapons effort and Tehran's lack of cooperation with the IAEA regarding its nuclear program severely undermine Iran's commitment to fostering conditions in which an NWFZ in the region could be established. Therefore, in spite of its rhetorical support for an NWFZ in the Middle East, it cannot currently be considered to be taking steps toward that purpose.

7. IAEA Safeguards: F

In September 2005, the IAEA Board of Governors adopted a resolution that found that Iran's undeclared nuclear activities prior to 2003 constituted noncompliance with its safeguards obligations.[186] Since 2003, Iran also has failed to cooperate fully with the agency in an ongoing investigation into its past and present nuclear activities. In particular, the IAEA stated in a November 2009 report to its Board of Governors that Iran's failure to notify the agency of the construction of an enrichment plant near the city of Qom prior to September of that year "was inconsistent with its obligations" under its safeguards agreement.[187] Along the same lines, the report also stated that Iran could not unilaterally reinterpret a provision of its safeguards agreement regarding when it is required to notify the agency about the construction of nuclear facilities. According to the IAEA, Iran is the only country "with significant nuclear activities" that is not implementing a safeguards provision requiring a state to provide the agency with notification and design information as soon as a decision is taken to construct a nuclear facility.[188]

Iran also has failed to fully account for a number of activities it has admittedly or allegedly carried out that the IAEA has declared may have relevance to a nuclear weapons program, including the alleged studies.[189]

Iran voluntarily began implementing an additional protocol after signing it in December 2003, but halted this cooperation in February 2006 in response to its referral to the Security Council by the IAEA that month. Iranian officials have stated that Tehran will only ratify its additional protocol once the Security Council drops its consideration of Iran's nuclear program and it is addressed solely by the IAEA.[190] Both the IAEA and the Security Council have repeatedly called on Iran to ratify the measure.

8. Nuclear Weapons-Related Export Controls: F

Iran has been one of the key targets for controls over the transfer of nuclear and missile-related materials and technology due to widespread concerns over its nuclear and ballistic missile programs. The UN Security Council has mandated controls internationally by adopting a series of resolutions requiring that all states prohibit the transfer of nearly all NSG Trigger List and Dual Use List items, as well as items contained in the MTCR Guidelines, to and from Iran.[191]

Iran is still believed to be engaged in a concerted effort to acquire prohibited technologies by circumventing NSG, MTCR, and UN restrictions. In the timeframe of this report the U.S. Department of the Treasury sanctioned 42 entities suspected of involvement in Iran's nuclear and missile programs, including procurement.[192] Moreover, in the last several years, including in 2009, a number of Iranian nationals or Iranian officials have been arrested in other countries for involvement in procuring goods and technologies in violation of national and international export restrictions.[193] This procurement included items relevant for Iran's nuclear and missile programs.

9. Nuclear Security Commitments: D+

According to a 2006 report to the Security Council's 1540 Committee, the Atomic Energy Organization of Iran (AEOI) established "Draft Regulations on the Physical Protection of Installations and Materials based on the CPPNM," but its status is unclear.[194]

A plus (+) is added to the grade because Iran has an IAEA safeguards agreement in force, and the AEOI acts as a nuclear regulatory authority that addresses physical protection and the licensing of facilities and entities.[195]

10. Criminalization and Illicit Trafficking Commitments: C

Iran participates in the ITDB.

Syria

Concerns about Syrian nuclear aspirations became particularly acute in 2007 when Israel destroyed a facility widely suspected of being a nuclear reactor under construction with North Korean assistance. Although countries with knowledge of the facility refused to disclose any details for eight months following the attack, in April 2008, U.S. intelligence agencies publicly shared their assessment that the suspected reactor was part of a nuclear weapons program. The IAEA has pursued an investigation into the possible reactor site, as well as potential related nuclear activities since that time, but Damascus has refused to fully cooperate with the investigation. The extent of any nuclear weapons program is still unknown. **Overall Grade: D**

1. Banning Nuclear Testing: C

Syria is an NPT member, but has not signed the CTBT. Its ratification is not required for entry into force.

U.S. Central Intelligence Agency

Image of a suspected Syrian nuclear reactor under construction with North Korean assistance from an April 24, 2008 Central Intelligence Agency (CIA) video. Israel destroyed the facility in September 2007, and Syria has not cooperated with an IAEA investigation about its possible role in a Syrian nuclear weapons effort.

2. Ending Fissile Material Production for Weapons: N/A

3. Reducing Nuclear Weapons Alert Levels: N/A

4. Nuclear Force Reductions: N/A

5. Negative Security Assurances: N/A

6. Nuclear-Weapon-Free Zones: C

Syria has declared support for the establishment of an NWFZ in the Middle East and proposed a resolution in the UN Security Council toward that goal in April 2003, although suspicion of possible Syrian nuclear weapons efforts suggests that commitment was not sincere.[196] In April 2008, the United States publicly accused Syria of building a nuclear reactor at a site called Dair al Zour, intended to produce plutonium for weapons.[197] Syria is not believed to have continued its suspected nuclear weapons effort following the destruction of the Dair al Zour facility by Israel in September 2007.

Syria has supported UN General Assembly resolutions supporting the establishment of NWFZs in Central and Southeast Asia and the recognition of a nuclear-weapon-free Southern Hemisphere.[198]

7. IAEA Safeguards: F

Syria concluded a comprehensive nuclear safeguards agreement with the IAEA in 1992.[199]

Since June 2008, however, Syria has failed to cooperate with an ongoing IAEA probe into suspected undeclared nuclear activities, including the role of the facility at Dair al Zour. A November 2009 IAEA report said that Syria has not provided the necessary cooperation for the agency to determine the origin of uranium particles detected at Dair al Zour, ascertain the purpose of the destroyed facility at that site and three related sites, or clarify procurement efforts consistent with the construction of a nuclear reactor.[200]

8. Nuclear Weapons-Related Export Controls: F

Damascus is believed to continue to import materials and technology for its ballistic missile program from Iran and North Korea in violation of UN sanctions.[201] In a 2009 unclassified report to Congress, the U.S. intelligence community stated that Syria is developing short-range ballistic missiles "with assistance from North Korea and Iran."[202]

9. Nuclear Security Commitments: D+

Syria has not signed the CPPNM.

A plus (+) is added to the grade because Syria has taken some steps to implement nuclear security measures domestically, including agreeing to implement the IAEA Code of Conduct.[203]

10. Criminalization and Illicit Trafficking Commitments: D+

Syria does not participate in any arrangements on preventing nuclear terrorism and illicit trafficking.

A plus (+) is added to the grade because Syria signed the Nuclear Terrorism Convention in September 2005.

Additional States

Beyond the 11 states specifically addressed in this report, a number of other states or groups of states have taken actions or positions of significance to the 10 standards. This section highlights some of the areas where such states have made a significant impact on the standards examined in this report or are poised to do so.

Banning Nuclear Testing

Two Annex 2 states have signed the CTBT and profess support for its aims, but so far have not ratified the pact.

Indonesia

Reversing its prior claims that it would await U.S. ratification of the CTBT in order to do so, Indonesia announced in May 2010 that it would seek ratification of the accord. When completed, the ratification would bring the number of Annex 2 states required for the treaty's entry into force from nine to eight. Indonesian Foreign Minister Marty Natalegawa told reporters in New York May 4, 2010, that the decision was taken "with a view to encouraging others, especially the nuclear-weapon states."[204]

Egypt

Cairo has linked progress on the CTBT to efforts to implement the 1995 Resolution on the Middle East, which calls for the establishment of a WMD-free zone in the region. In its statement at the 2009 Conference on Facilitating the CTBT Entry Into Force, Egypt stated that commitments to carry out that resolution at the 2010 NPT Review Conference "will open the doors for a new horizon to the CTBT."[205] That review conference agreed on some steps toward implementing the Resolution on the Middle East, including a call to convene a regional conference on the establishment of a regional WMD-free zone, although it is unclear whether Cairo will adjust its position on the CTBT.

Nuclear Force Reductions

NATO

Long-standing nuclear-sharing arrangements between the United States and several of its NATO allies allow some non-nuclear-weapon states to play a direct role in nuclear force reductions.[206] Independent estimates suggest that the United States continues to station 150 to 240 nonstrategic nuclear weapons at six bases in Belgium, Germany, Italy, the Netherlands, and Turkey.[207] Under the nuclear-sharing arrangements, these countries would provide the aircraft that would deliver the nuclear bombs to their targets.

In October 2009, the German government said that, in the context of discussions over NATO's new Strategic Concept over the following year, Berlin would "advocate a withdrawal of remaining nuclear weapons from Germany."[208] Germany insisted, however, that such a decision not be taken unilaterally and be carried out in a multilateral framework. A February 2010 letter sent by five foreign ministers of NATO member states (Belgium, Germany, Luxembourg, the Netherlands, and Norway) called for discussing the status of U.S. tactical nuclear weapons in Europe at a meeting of NATO foreign ministers that took place April 2010 in Tallinn.[209] During the meeting, Secretary of State Hillary Rodham Clinton outlined five principles that should guide the discussion, including the need to seek Russian transparency on nonstrategic nuclear weapons as part of any future reductions and the need to "broaden deterrence against the range of 21st century threats, including by pursuing territorial missile defense."[210] NATO Secretary-General Anders Fogh Rasmussen said that U.S. nuclear weapons in Europe are an "essential part of a credible deterrent."[211] The report of a NATO group of experts released soon afterward reached a similar conclusion regarding the status of U.S. tactical nuclear weapons in Europe.[212]

JASON REED/AFP/Getty Images

(From left to right) French President Nicolas Sarkozy, Canadian Prime Minister Stephen Harper, U.S. President Barack Obama, Russian President Dmitry Medvedev, German Chancellor Angela Merkel, and British Prime Minister David Cameron share a light moment June 25, 2010 during the Group of Eight (G8) Summit in Huntsville, Canada. At that meeting the group reiterated prior calls for the Nuclear Suppliers Group to reach consensus on criteria for the transfer of sensitive nuclear fuel cycle technologies.

Both the report and the April meeting indicated that NATO members will not deal with the subject of tactical nuclear weapons before the November 2010 Strategic Concept conference in Lisbon.

NATO members have generally held that the weapons stationed in Europe would be removed in the context of negotiations on nonstrategic nuclear weapons with Russia, which has a much larger arsenal of such weapons.[213]

Nuclear-Weapon-Free Zones

Two NWFZs entered into force in 2009, increasing the number of zones in force to five. In addition, the 2010 NPT Review Conference agreed on steps to begin discussions on a WMD-free zone in the Middle East.

Central Asian NWFZ

The Central Asian NWFZ Treaty opened for signature in September 2006 and entered into force in March 2009, with five states-parties: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. The treaty includes a number of responsibilities in addition to the traditional regional pledges not to develop or host nuclear weapons and to implement safeguards. These requirements include the adoption of IAEA comprehensive safeguards and an additional protocol, as well as the implementation of international standards for the security of nuclear facilities and materials. In addition, they must fully comply with the CTBT.[214]

The treaty seeks to address the lasting legacy of the nuclear tests and weapons development activities conducted by the Soviet Union in the five states through environmental rehabilitation measures. This aspect highlights the zone's historical significance as it not only contains locations that once housed critical parts of the Soviet weapons program, but one state, Kazakhstan, inherited about 1,400 nuclear weapons, including ICBMs, from the Soviet Union in the aftermath of its dissolution.

France, the United Kingdom, and the United States objected to the stipulation in the treaty that allows for previous security agreements to take precedence over its provisions. In particular, they are concerned with

the 1992 Tashkent Collective Security Treaty, which allows Russia to transport nuclear weapons through the region or deploy them there in the future.[215]

African NWFZ

The Treaty of Pelindaba, which entered into force in July 2009, established a NWFZ throughout Africa. As of April 2010, the treaty has 28 members, and a total of 52 states have signed it. States-parties undertake to prohibit the stationing of nuclear weapons in their territory. Parties are permitted to decide whether to allow visits by foreign ships and aircraft to their ports or airfields, as well as whether to allow the transportation of weapons through their airspace or coastal territory. States are required to accept full-scope IAEA safeguards. The zone contains one state, South Africa, that had built and subsequently relinquished nuclear weapons, and another, Libya, that gave up an ongoing nuclear weapons program in 2004.

A symbolic impact of the entry into force of the zone was establishing a de facto nuclear-weapon-free southern hemisphere, as all states below the equator are now situated in a zone that has entered into force.

All five nuclear-weapon states have signed the protocol, but the ratifications of the United States and Russia are still pending.[216]

Middle East Weapons of Mass Destruction-Free Zone

Proposals for an NWFZ in the Middle East have been issued since the 1970s, and since that time, the UN General Assembly has adopted annual resolutions by consensus in support of that goal. As part of the package of decisions to extend the NPT indefinitely in 1995, the states-parties agreed on a Resolution on the Middle East calling for the establishment of a WMD-free zone in the region. Little progress has been made to implement that resolution.

During the 2010 NPT Review Conference, states-parties agreed on a consensus final document that included several practical steps toward implementing the 1995 resolution. Key among those steps is a call to convene a regional conference to discuss the matter in 2012. The states-parties also agreed that the conference would be preceded by a series of preparatory consultations between states in the region, led by a UN-appointed facilitator. Relevant international organizations, including the Organization for the Prohibition of Chemical Weapons and the IAEA, are to be engaged in this preparatory work.

Egypt in particular had been instrumental during the NPT review process in proposing steps toward the creation of the Middle East zone, submitting a number of working papers for that purpose, including proposals to hold a regional conference on the issue.

IAEA Safeguards

Article III of the NPT requires states to adopt comprehensive safeguards with the IAEA irrespective of the presence of nuclear material and facilities. As of June 2010, the following 20 states have not fulfilled this basic requirement of the treaty:

Signed but Not Ratified a Safeguards Agreement	Has Not Signed a Safeguards Agreement
Andorra, Benin, Cape Verde, Djibouti, Montenegro, Mozambique, Rwanda, Republic of the Congo, Republic of Macedonia, Timor-Leste, Togo	Equatorial Guinea, Eritrea, Federated States of Micronesia, Guinea, Guinea-Bissau, Liberia, Sao Tome and Principe, Somalia, Vanuatu

Nuclear Weapons-Related Export Controls

Nuclear Suppliers Group[217]

One of the critical elements of strengthening the nuclear nonproliferation regime has been efforts to address the most sensitive aspects of the nuclear fuel cycle: uranium enrichment and spent fuel reprocessing. One decision that has been under consideration over the past several years has been the development of criteria under which NSG members would agree to transfer these technologies to additional states.[218]

The criteria being discussed by the NSG for transfers of sensitive fuel-cycle technology include "objective" and "subjective" elements. The objective criteria include requirements that the state is a member of the NPT, has comprehensive safeguards and an additional protocol in force, and is in compliance with its IAEA safeguards obligations. The subjective standards include taking into account the security environment of the region and the potential impact of any transfers on regional stability.

To date, however, the NSG has been unable to agree on the criteria for transferring enrichment and reprocessing technology. Although progress had been made in addressing prior concerns raised by Canada (regarding a requirement to limit the spread of the technology through "black box" techniques) and Brazil (regarding its opposition to the additional protocol), additional concerns have been raised by countries such as Turkey regarding some of the subjective restrictions.[219]

As the NSG continues to negotiate over the criteria for transfers of enrichment and reprocessing technologies, the G-8 agreed in 2009 to adopt the criteria

State	National Commitments during the 2010 Nuclear Security Summit
Argentina	Joined the GICNT; moving toward the ratification of the Nuclear Terrorism Convention and the 2005 CPPNM amendment.
Armenia	Ratified the Nuclear Terrorism Convention and passed a new export control law.
Australia	Moving toward the ratification of the Nuclear Terrorism Convention.
Belgium	Contributing $300,000 to the IAEA Nuclear Security Fund.
Canada	Returning a large amount of spent HEU fuel from their medical isotope production reactor to the United States; championed the extension of the G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction; funding HEU removals from Mexico and Vietnam; hosting and funding a World Institute of Nuclear Security best practices workshop in Ottawa; unveiled $100 million in new bilateral security cooperation with Russia.
Chile	Removed all HEU (18 kilograms) in March 2010.
Egypt	Passed new comprehensive nuclear law in March 2010 that includes nuclear security, criminalization of sabotage, and illicit trafficking provisions as well as envisaging an independent regulatory authority.
Finland	Invited an International Physical Protection Advisory Service security review from the IAEA.
Georgia	Signed instrument of approval for Nuclear Terrorism Convention on April 7, 2010.
Germany	Moving toward ratifying 2005 CPPNM amendment.
Italy	Signed a Megaports agreement (to install detection equipment at ports); establishing a school of nuclear security in Trieste, in collaboration with the Abdus Salam International Center for Theoretical Physics and the IAEA, to train nuclear personnel from developing countries.
Japan	Launching an integrated regional support center; research and development on detection and forensics; contributing new resources to IAEA Nuclear Security Fund; hosting and funding a World Institute of Nuclear Security best practices conference.
Kazakhstan	Converting an HEU research reactor and eliminating remaining HEU; cooperative work on BN-350 rector shutdown and fuel security; hosting a GICNT activity in June; considering a International Nuclear Security Training Center.
Malaysia	Passed new export control law.
Mexico	Converting an HEU research reactor and eliminating remaining HEU working through the IAEA.
New Zealand	Contributing to IAEA Nuclear Security Fund; contributing to the U.S. Nuclear Smuggling Outreach Initiative.
Norway	Contributing $3.3 million over the next four years to the IAEA Nuclear Security Fund (flexible funds for use for activities in developing countries); contributing $500,000 in additional support to Kazakhstan's efforts to upgrade portal monitors to prevent nuclear smuggling as part of the GICNT.
Philippines	Joining the GICNT.
Republic of Korea	Hosting 2012 nuclear security summit; hosting a GICNT activity.
Russia	Signing Plutonium Disposition protocol; ending plutonium production; contributing to the IAEA Nuclear Security Fund.
Saudi Arabia	Hosting a Resolution 1540 conference for the Gulf Cooperation Council.
Thailand	Joining the GICNT.
Ukraine	Removing all HEU by next summit, half by year's end.
UAE	Signed a Megaports Agreement with the United States.
Vietnam	Converting a HEU research reactor; joining the GICNT.

considered by the NSG in a November 2008 proposal on a national basis over the following year.[220] In a statement released during the G-8 July 8-10, 2009, summit in L'Aquila, Italy, the members, which are all also NSG participants, urged the NSG "to accelerate its work and swiftly reach consensus" on the new rules. The G-8 extended this call at its June 25-26, 2010, meeting in Huntsville, Canada.[221]

Nuclear Security, Criminalization, and Illicit Trafficking Commitments

Nuclear Security Summit

The United States convened the first nuclear security summit in April 2010 to agree on steps to secure fissile material from theft or misuse within four years. The summit was chaired by Obama and attended by 47 national delegations and representatives of major international organizations.[222] Discussion focused on the threat posed by unsecured nuclear material if it were to fall into the hands of terrorists, and the participants agreed to a communiqué and a work plan outlining steps to address that threat.

The communiqué reaffirmed state commitments to a number of nuclear security initiatives while the work plan went further in identifying several broad steps that states agreed to take to prevent nonstate actors from acquiring fissile material. In particular, the two documents called for greater adherence to the Nuclear Terrorism Convention and the CPPNM and for the full implementation of Resolution 1540. The participants also stressed the importance of the Global Initiative to Combat Nuclear Terrorism (GICNT), especially the involvement of nuclear industry, law enforcement agencies, and technical personnel in reducing nuclear threats.

Many states in attendance carried out or committed to carry out specific actions to secure fissile material or enhance global nuclear security. In addition to the steps taken by some of the countries considered by this report, additional states undertook the commitments summarized on the previous page.[223]

NOTES

1. The 1963 Partial Test-Ban Treaty, which forbids testing in the atmosphere, underwater, and in outer space, established the norm of underground nuclear testing. Even countries not party to the treaty that have tested nuclear weapons (China, France, and North Korea) reverted at some point to doing so only underground.

2. 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, "Final Document," NPT/CONF.2000/28 (Parts I and II), 2000, www.armscontrol.org/act/2000_06/docjun.

3. 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, "Final Document," NPT/CONF.2010/50 (Vol. I), 2010, p. 22, www.un.org/ga/search/view_doc.asp?symbol=NPT/CONF.2010/50%20%28VOL.I%29 (Action 10) (hereinafter 2010 NPT Review Conference Final Document).

4. In December 2008, the UN General Assembly adopted a resolution entitled "Decreasing the operational readiness of nuclear weapons systems," which called for further steps to reduce nuclear weapons readiness levels "with a view to ensuring that all nuclear weapons are removed from high alert status." The measure was adopted by a vote of 141-3 (France, the United Kingdom, and the United States) with 34 abstentions. UN General Assembly, Resolution 63/41, A/RES/63/41, January 12, 2009.

5. In accordance with Article X of the nuclear Nonproliferation Treaty (NPT), which calls for a conference to decide on the indefinite extension of the treaty 25 years after its entry into force, states-parties held a review and extension conference in 1995. The result was a package of decisions including the treaty's indefinite extension, a series of principles and objectives guiding the further implementation of the NPT, and a Resolution on the Middle East calling for a weapons of mass destruction-free zone in the region.

6. 2010 NPT Review Conference Final Document, Action 3.

7. The earliest proposed nuclear-weapon-free zone (NWFZ) was in 1958, when the Polish government issued a failed call for such a zone in Central Europe in order to prevent the deployment of Soviet nuclear weapons on its territory. See Jozef Goldblat, "Nuclear Weapon Free Zones: A History and an Assessment," *Nonproliferation Review*, No. 4 (Spring-Summer 1997), p. 19.

8. In 1978 legislation, the United States mandated that importers have full-scope safeguards to receive U.S. nuclear exports. At the urging of the United States, the Nuclear Suppliers Group (NSG) adopted the same rule in 1992. NPT states-parties subsequently endorsed this standard in 1995 and 2000.

9. The International Atomic Energy Agency (IAEA) General Conference is an annual meeting of IAEA member states and the agency's "highest policymaking body."

10. Gustavo Zlauvinen, Presentation to the UN General Assembly First Committee, October 17, 2007 (IAEA director-general representative to the United Nations).

11. 2010 NPT Review Conference Final Document, Action 36.

12. IAEA, "Nuclear Security," n.d., www-ns.iaea.org/security/.

13. UN General Assembly, "International Convention for the Suppression of Acts of Terrorism," A/RES/59/290, April15, 2005, http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N04/494/53/PDF/N0449453.pdf?OpenElement.

14. Following Libya's renunciation of weapons of mass destruction in 2004, Tripoli was found to be in possession of a Pakistani-supplied Chinese nuclear weapons design. Other designs also believed to be of Chinese origin were found in the possession of members of the Abdul Qadeer Khan network. See Sharon A. Squassoni, "Weapons of Mass Destruction: Trade Between North Korea and Pakistan," *CRS Report for Congress*, RL31900, November 28, 2006, www.fas.org/sgp/crs/nuke/RL31900.pdf.

15. "Statement of the Government of the People's Republic of China," July 29, 1996, www.nti.org/db/china/engdocs/stat0796.htm.

16. Shen Guofang, Statement at the 2nd Conference on Facilitating the Entry Into Force of the Comprehensive Nuclear-Test-Ban Treaty, November 12, 2001, www.china-un.org/eng/chinaandun/disarmament_armscontrol/npt/t29291.htm.

17. Scarlet Kim and Alex Bollfrass, "Arms Control and Proliferation Profile: China," Arms Control Association, n.d., www.armscontrol.org/factsheets/chinaprofile.

18. David Albright and Corey Hinderstein, "Chinese Military Plutonium and Highly Enriched Uranium Inventories," Institute for Science and International Security, June 30, 2005, http://isis-online.org/uploads/isis-reports/documents/chinese_military_inventories.pdf.

19. International Panel on Fissile Materials (IPFM), "Global Fissile Material Report 2009: A Path to Nuclear Disarmament," 2009, www.fissilematerials.org/ipfm/site_down/gfmr09.pdf.

20. Mark A. Stokes, "China's Nuclear Warhead Storage and Handling System," Project 2049 Institute, March 12, 2010, www.project2049.net/documents/chinas_nuclear_warhead_storage_and_handling_system.pdf.

21. UN Document GA/10792, http://www.un.org/News/Press/docs/2008/ga10792.doc.htm.

22. Information Office of the State Council of the People's Republic of China, "China's National Defense in 2008," January 2009, www.china.org.cn/government/central_government/2009-01/20/content_17155577.htm (hereinafter China 2008 white paper on defense).

23. Federation of American Scientists, "Status of World Nuclear Forces," www.fas.org/programs/ssp/nukes/nuclearweapons/nukestatus.html.

24. Office of the Secretary of Defense, "The Military Power of the People's Republic of China 2005," July 20, 2005, p. 45; U.S. Department of Defense, "Military Power of the People's Republic of China 2008," March 3, 2008, p. 56; Hans Kristensen and Robert Norris, "Chinese Nuclear Forces, 2008," *Bulletin of the Atomic Scientists*, July/Aug. 2008, pp. 42-44. U.S. Department of Defense, "Annual Report to Congress: Military Power of the PRC 2009," March 2009, p. 24.

25. UN Department of Public Information, "Concerned About High-Alert Status of Nuclear Weapons, General Assembly Would Call for Decrease in Operational Readiness, by New Draft Approved in First Committee," November 1, 2008, www.un.org/News/Press/docs/2007/gadis3357.doc.htm.

26. China 2008 white paper on defense.

27. Kim and Bollfrass, "Arms Control and Proliferation Profile: China."

28. Monterey Institute Center for Nonproliferation Studies, "International Atomic Energy Agency (IAEA) Safeguards," n.d., www.nti.org/db/China/iaeasg.htm.

29. U.S. Department of State, "Adherence to and Compliance With Arms Control, Nonproliferation, and Disarmament Agreements and Commitments," August 30, 2005, www.state.gov/t/vci/rls/rpt/51977.htm.

30. UN Security Council, "Letter Dated 4 October 2004 From the Permanent Representative of China to the United Nations Addressed to the Chairman of the Committee," S/AC.44/2004/

(02)/4, October 14, 2004, www.un.org/Docs/journal/asp/ws.asp?m=S/AC.44/2004/%2802%29/4 (report of China on implementation of UN Security Council Resolution 1540) (hereinafter China 2004 report on Resolution 1540 implementation); UN Security Council, "Letter Dated 2 September 2005 From the Permanent Representative of China to the United Nations Addressed to the Chairman of the Committee," S/AC.44/2004/(02)/4/Add.1, October 28, 2005, www.un.org/Docs/journal/asp/ws.asp?m=S/AC.44/2004/%2802%29/4/Add.1 (supplementary report on steps taken by China to implement Security Council Resolution 1540) (hereinafter China 2005 supplementary report on Resolution 1540 implementation).

31. Weapons Intelligence, Nonproliferation, and Arms Control Center, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions (Covering 1 January to 31 December 2009)," n.d., www.dni.gov/reports/2009_721_Report.pdf (hereinafter DNI 2009 weapons technology acquisition report).

32. Shirley A. Kan, "China and Proliferation of WMDs and Missiles: Policy Issues," *CRS Report for Congress*, RL31555, May 2009, p. 18, www.fas.org/sgp/crs/nuke/RL31555.pdf.

33. Daniel Horner, "China, Pakistan Set Reactor Deal," *Arms Control Today*, June 2010, www.armscontrol.org/act/2010_06/ChinaPakistan.

34. 2010 NPT Review Conference Final Document, para. 118.

35. China 2004 report on Resolution 1540 implementation; China 2005 supplementary report on Resolution 1540 implementation. See Hui Zhang, "Evaluating China's MPC&A System," n.d., http://belfercenter.ksg.harvard.edu/files/mpc&a.pdf.

36. IAEA, "IAEA to Assist China and Qatar on Nuclear Security," June 26, 2007, www.iaea.org/NewsCenter/News/2007/china_qatar.html.

37. François Rivasseau, Statement to the Conference on Disarmament, Geneva, March 2, 2006, www.delegfrance-cd-geneve.org/english/declarations/02032006plenieregbagendafuturesmesures.pdf.

38. Ibid.

39. France TNP2010, "Disarmament," n.d., www.francetnp2010.fr/spip.php?article91.

40. Acronym Institute for Disarmament Diplomacy, "Reducing the Role of Nuclear Weapons: A Global and Regional Security Imperative," 2010 and Beyond: NPT Briefing 3, http://www.acronym.org.uk/npt/npt2010%20B3%20-%20Reducing%20the%20Role%20of%20NWs.pdf.

41. UN General Assembly, Resolution 63/41, A/RES/63/41, January 12, 2009.

42. UN Department of Public Information, "Concerned About High-Alert Status of Nuclear Weapons, General Assembly Would Call for Decrease in Operational Readiness, by New Draft Approved in First Committee."

43. Nicolas Sarkozy, "Presentation of SSBM 'Le Terrible,'" March 21, 2008, http://www.ambafrance-uk.org/President-Sarkozy-s-speech-at,10430.html.

44. Ibid.

45. UN General Assembly, "Letter Dated 6 April 1995 From the Permanent Representative of France to the United Nations Addressed to the Secretary-General," A/50/154, April 6, 1995, www.reachingcriticalwill.org/resources/S1995-264.pdf (statement concerning security assurances to non-nuclear-weapon states made by the permanent representative of France to the Conference on Disarmament on 6 April 1995).

46. Presidence de la Republique, "The French White Paper on Defense and National Security," 2008, www.ambafrance-ca.org/IMG/pdf/Livre_blanc_Press_kit_english_version.pdf.

47. Arms Control Association (ACA), "Nuclear Weapon-Free Zones (NWFZ) at a Glance," www.armscontrol.org/factsheets/nwfz.

48. IAEA, "Country Factsheet: France," March 30, 2010, http://ola.iaea.org/factSheets/CountryDetails.asp?country=FR.

49. 1540 Committee, "France Revised Matrix," April 18, 2008, www.un.org/sc/1540/docs/matrices/France%20revised%20matrix.pdf.

50. Ibid.

51. UN Security Council, "Letter Dated 28 October 2004 From the Permanent Representative of France to the United Nations Addressed to the Chairman of the Committee," S/AC.44/2004/(02)/58, November 15, 2004, www.un.org/Docs/journal/asp/ws.asp?m=S/AC.44/2004/%2802%29/58 (report submitted by France to the 1540 Committee); UN Security Council, "Letter Dated 25 August 2005 From the Chargé d'affaires a.i. of the Permanent Mission of France to the United Nations Addressed to the Chairman of the Committee," S/AC.44/2004/(02)/58/Add.1, September 6, 2005, www.un.org/Docs/journal/asp/ws.asp?m=S/AC.44/2004/%2802%29/58/Add.1 (response of France to the request for additional information by the 1540 Committee).

52. Bureau of International Information Programs, U.S. Department of State, "Highlights of Nuclear Security Commitments," April 13, 2010, www.america.gov/st/texttrans-english/2010/April/20100414171540ptellivremos0.8436396.html.

53. USEC Inc., "Megatons to Megawatts," n.d., www.usec.com/megatonstomegawatts.htm.

54. Bureau of International Information Programs, U.S. Department of State, "Clinton, Russia's Lavrov on the Plutonium Disposition Protocol," April 13, 2010, www.america.gov/st/texttrans-english/2010/April/20100413191024abretnuh0.9652783.html.

55. Robert S. Norris and Hans M. Kristensen, "Nuclear Notebook: Russian Nuclear Forces, 2009," *Bulletin of the Atomic Scientists*, May/June 2009, http://thebulletin.metapress.com/content/h304370t70137734/fulltext.pdf.

56. Bruce Blair, "A Rebuttal of the U.S. Statement on the Alert Status of U.S. Nuclear Forces," Center for Defense Information, November 6, 2007, endnote 5, www.cdi.org/program/document.cfm?documentid=4135.

57. UN Department of Public Information, "General Assembly Moves to Decrease Operational Readiness of Nuclear Weapons Systems, by 1 of 52 Texts Adopted on Recommendation of First Committee," December 5, 2007, www.un.org/News/Press/docs/2007/ga10666.doc.htm.

58. Amy F. Woolf, "Nonstrategic Nuclear Weapons," *CRS Report for Congress*, RL32572, January 14, 2010, www.fas.org/sgp/crs/nuke/RL32572.pdf.

59. Ibid.

60. UN General Assembly, "Letter Dated 6 April 1995 From the Permanent Representative of the Russian Federation to the United Nations Addressed to the Secretary-General," A/50/151, April 6, 1995, www.reachingcriticalwill.org/resources/S1995-261.pdf (statement dated April 5, 1995, by the representative of the Russian Ministry of Foreign Affairs).

61. Chris Baldwin, "Russia Could Strike Poland Over U.S. Shield: Report," Reuters, August 16, 2008.

62. ACA, "Nuclear-Weapon-Free-Zones (NWFZ) at a Glance."

63. IAEA, "Status List," December 15, 2009, www.iaea.org/OurWork/SV/Safeguards/sir_table.pdf.

64. 1540 Committee, "Russian Federation Revised Matrix," April 18, 2008, p. 39, www.un.org/sc/1540/docs/matrices/Russian%20Federation%20revised%20matrix.pdf.

65. DNI 2009 weapons technology acquisition report.

66. 1540 Committee, "Russian Federation Revised Matrix."

67. Henry L. Stimson Center, "The G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction," June 1, 2007, www.stimson.org/MAB/?SN=CT200705231266.

68. Pavel Podvig, "Consolidating Fissile Materials in Russia's Nuclear Complex," *International Panel on Fissile Materials Research Report*, No. 7 (May 2009), www.fissilematerials.org/ipfm/site_down/rr07.pdf.

69. Alex Bollfrass, "Arms Control and Proliferation Profile: The United Kingdom," ACA, n.d., www.armscontrol.org/factsheets/ukprofile.

70. British Secretary of State for Defence, "Strategic Defence Review," July 1998, pp. 26-27, www.mod.uk/NR/rdonlyres/65F3D7AC-4340-4119-93A2-20825848E50E/0/sdr1998_complete.pdf.

71. The United Kingdom has four Vanguard nuclear-powered ballistic missile submarines. Each submarine is armed with as many as 16 Trident missiles and up to 48 warheads. Only one submarine is on active duty at a time. Bollfrass, "Arms Control and Proliferation Profile: The United Kingdom."

72. In 2007, then-British Defense Minister Des Browne said in response to a question for the record from the House of Commons that the United Kingdom "has for many years retained only the minimum nuclear capabilities we require and as a result we have the smallest stockpile of any of the nuclear weapon states recognized under the NPT." See Parliament, "Daily Hansard - Written Answers," May 16, 2007, www.publications.parliament.uk/pa/cm200607/cmhansrd/cm070516/text/70516w0015.htm#07051686000187.

73. British Foreign and Commonwealth Office, "UK Minister Attends Review Conference Following UK Disclosure of Nuclear Stockpile," May 26, 2010, www.fco.gov.uk/en/news/latest-news/?view=News&id=22285726.

74. John Duncan, Statement to the 2008 Nonproliferation Treaty Preparatory Committee Cluster 1 – Nuclear Disarmament, April 30, 2008, http://ukunarmscontrol.fco.gov.uk/resources/en/pdf/pdf1/postgv_npt2008cluster1.

75. Gordon Brown, Speech on nuclear energy and proliferation, March 17, 2009, www.number10.gov.uk/Page18631.

76. The debate surrounding the possible elimination of a submarine arose following a statement by Prime Minister Gordon Brown in September 2009. See Michael Knigge, "Aims and Consequences of Britain's Nuclear Arms Reduction Initiative Don't Always Coincide," *Deutsche Welle*, September 24, 2009, www.dw-world.de/dw/article/0,,4721421,00.html.

77. George Bunn and Roland Timerbaev, "Security Assurances to Non-Nuclear-Weapon States: Possible Options for Change," *Programme for Promoting Nuclear Non-Proliferation*, No. 7 (September 1996), www.ppnn.soton.ac.uk/ir07.pdf.

78. "UK Nuke Policy From Geoff Hoon," March 24, 2002, http://cndyorks.gn.apc.org/news/articles/uknukepolicy.htm.

79. In response to a July 15, 2002, parliamentary Defence Question, Hoon said, "British Government policy has not changed since John Major, during the Gulf War, explicitly ruled out the use of British nuclear weapons against Iraq, even in reply to a chemical or biological attack on our forces, on the grounds that a proportionate response could be made using conventional weapons and that Britain would never breach the Nuclear Non-Proliferation Treaty." Defence Questions, July 15, 2002, Columns 10f, cf. Early Day Motion 1707 [Session 2001-2], (23.07.2002).

80. ACA, "Nuclear-Weapon-Free-Zones (NWFZ) at a Glance."

81. IAEA, "Status List."

82. Daniel Horner, "G-8 Tightens Nuclear Export Rules," *Arms Control Today*, September 2009, www.armscontrol.org/act/2009_09/G8; Daniel Horner, "Accord on New Rules Eludes Nuclear Suppliers," *Arms Control Today*, July/August 2009, www.armscontrol.org/node/3729.

83. See 1540 Committee, "Assistance From Member States," n.d., www.un.org/sc/1540/memberstatesassistance.shtml.

84. 1540 Committee, "United Kingdom of Great Britain and Northern Ireland Revised Matrix," April 18, 2008, www.un.org/sc/1540/docs/matrices/UK%20revised%20matrix.pdf; UN Security Council, "Note Verbale Dated 19 September 2005 From the Permanent Mission of the United Kingdom of Great Britain and Northern Ireland to the United Nations Addressed to the Committee," S/AC.44/2004/(02)/3/Add.1, October 4, 2005, www.un.org/Docs/journal/asp/ws.asp?m=S/AC.44/2004/%2802%29/3/Add.1 (hereinafter second report of the United Kingdom on Resolution 1540 implementation).

85. Second report of the United Kingdom on Resolution 1540 implementation.

86. Ibid.

87. U.S. Department of Defense, "Increasing Transparency in the U.S. Nuclear Weapons Stockpile," May 3, 2010, www.defense.gov/npr/docs/10-05-03_Fact_Sheet_US_Nuclear_Transparency__FINAL_w_Date.pdf (fact sheet).

88. "Arms Control Today 2008 Presidential Q&A: President-elect Barack Obama," A*rms Control Today*, December 2008.

89. IPFM, "Global Fissile Material Report 2009."

90. Bureau of International Information Programs, U.S. Department of State, "Clinton, Russia's Lavrov on the Plutonium Disposition Protocol."

91. Hans M. Kristensen, "Obama Ask UN De-Alerting Resolution to Wait," *FAS Strategic Security Blog*, October 16, 2009, www.fas.org/blog/ssp/2009/10/dealert-2.php#more-1858.

92. U.S. Department of Defense, "Nuclear Posture Review Report," April 2010, www.defense.gov/npr/docs/2010%20nuclear%20posture%20review%20report.pdf (hereinafter NPR report).

93. Ibid.

94. Daryl G. Kimball, Tom Z. Collina, and Peter Crail, "U.S. Negative Security Assurances at a Glance," Arms Control Association, January 2008, www.armscontrol.org/factsheets/negsec.

95. NPR report.

96. The NPR report states that "the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of the biological weapons threat and U.S. capacities to counter that threat." NPR report, p. viii.

97. Office of the Spokesman, U.S. Department of State, "U.S. Opening Statement Announcements at NPT Review Conference," 2010/557, May 3, 2010, http://usun.state.gov/briefing/statements/2010/141415.htm.

98. IAEA, "Status List."

99. "Overview of United States National Action Plan for Implementation of Resolution 1540," April 20, 2007, www.un.org/sc/1540/docs/otherdocuments/USNationalActionPlan.pdf.

100. 1540 Committee, "United States of America Revised Matrix," April 18, 2008, www.un.org/sc/1540/docs/matrices/USA%20revised%20matrix.pdf; UN Security Council, "Letter Dated 13 September 2005 From the Deputy Permanent Representative of the United States of America to the United Nations Addressed to the Chairman of the Security Council Committee Established Pursuant to Resolution 1540 (2004)," S/AC.44/2004/(02)/5/Add.1, April 18, 2008, www.un.org/Docs/journal/asp/ws.asp?m=S/AC.44/2004/%2802%29/5/Add.1 (U.S. follow-up report to the 1540 Committee).

101. Mary Beth Nikitin, "Securing Nuclear Materials: The 2010 Summit and Issues for Congress," *CRS Report for Congress*, RL41169, April 16, 2010, www.fas.org/sgp/crs/nuke/R41169.pdf.

102. India took part in blocking the adoption of the Comprehensive Test Ban Treaty (CTBT) in the Conference on Disarmament (CD) in 1996. India articulated its policy related to the CTBT at the UN General Assembly on September 29, 1995.

> Two years ago, the international community at last agreed to negotiate a Comprehensive Test Ban Treaty. We are glad that negotiations are in progress, but we also note that nuclear weapon states have agreed to a CTBT only after acquiring the know-how to develop and refine their arsenals without the need for tests. In our view, the CTBT must be an integral step in the process of nuclear disarmament. Developing new warheads or refining existing ones after a CTBT is in place, and/or using innovative technologies, would be as contrary to the spirit of CTBT as the NPT is to the spirit of non-proliferation.

103. See Wade Boese, "NSG Congress Approve Nuclear Trade With India," *Arms Control Today*, October 2008.

104. Indian Prime Minister Manmohan Singh articulated India's position on a fissile material cutoff treaty (FMCT) on May 17, 2006, stating, "India has made it clear that it is not prepared to accept a voluntary moratorium on production of fissile material for nuclear weapons or other nuclear explosive devices. India is only committed to negotiate a Fissile Material Cut-off Treaty in the Conference on Disarmament in Geneva " IPFM, "Banning the Production of Fissile Materials for Nuclear Weapons: Country Perspectives on the Challenges to a Fissile Material (Cutoff) Treaty," 2008, www.fissilematerials.org/ipfm/site_down/gfmr08cv.pdf.

105. Walter Pincus, "U.N. Hopes to Ban New Fissionable Material, Space-Based Weapons," *The Washington Post*, June 2, 2009.

106. Embassy of India, "India-U.S. Joint Statement," July 18, 2005, http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html.

107. IPFM, "Global Fissile Material Report 2009."

108. R. Rajaraman, "Estimates of India's Fissile Material Stocks," *Science and Global Security*, Vol. 16, No. 8 (2008), www.princeton.edu/sgs/publications/sgs/archive/Rajaraman-Vol-16-No-3.pdf.

109. Paul Brannan, "India Expanding Military Nuclear Site," Institute for Science and International Security (ISIS), June 2, 2010, http://isis-online.org/isis-reports/detail/india-expanding-military-nuclear-site/.

110. Sharon Squassoni, "Indian and Pakistani Nuclear Weapons," *CRS Report for Congress,* RS21237, February 17, 2005, www.ndu.edu/library/docs/crs/crs_rs21237_17feb05.pdf.

111. UN General Assembly, Resolution 64/37, A/RES/64/37, January 12, 2010, www.un.org/Docs/journal/asp/ws.asp?m=A/RES/64/37.

112. Indian Ministry of Defense Press Release, "India Will Continue to Strive Towards Achieving Minimum Deterrence—Antony," February 13, 2007.

113. National Air and Space Intelligence Center (NASIC), "Ballistic and Cruise Missile Threat," NASIC-1031-0985-09, 2009, www.fas.org/programs/ssp/nukes/NASIC2009.pdf. See Norris and Kristensen, "Indian Nuclear Forces, 2008."

114. Hamid Rao, Remarks to the UN General Assembly First Committee, October 15, 2009.

115. Embassy of India, "Draft Report of National Security Advisory Board on Indian Nuclear Doctrine," August 1999, http://www.pugwash.org/reports/nw/nw7a.htm.

116. Bharat Karnad, "Minimum Deterrence and the India-US Nuclear Deal," n.d., www.india-seminar.com/2007/569/569_bharat_karnad.htm.

117. "May Have to Revisit Nuclear No-First Use Policy: Army Chief," *Times of India*, September 6, 2009, http://timesofindia.indiatimes.com/india/May-have-to-revisit-nuclear-no-first-use-policy-Army-chief/articleshow/4977129.cms.

118. Since 1996 the issue of a nuclear-weapon-free zone (NWFZ) in South Asia has been raised in annual resolutions supporting a nuclear-weapon-free Southern Hemisphere, which welcomed steps to establish additional NWFZs, including in South Asia. In separate votes over whether to support such steps in the region, India has consistently voted no. It also voted against specific resolutions supporting as NWFZ in South Asia, which were issued almost annually between 1794 and 1997. See UN Department of Public Information, "On Recommendation of First Committee, General Assembly Adopts 54 Texts, Sets Aside Four Weeks in 2012 to Hammer Out Legally Binding Arms Trade Treaty," GA/10898, December 2, 2009, www.un.org/News/Press/docs/2009/ga10898.doc.htm.

119. IAEA General Conference, "Statement of Financial Contributions to the Agency as at 11 September 2009: Report by the Director General," GC(53)/INF/8, September 14, 2009, www.iaea.org/About/Policy/GC/GC53/GC53InfDocuments/English/gc53inf-8_en.pdf.

120. In 2006 the U.S. Congress adopted legislation stipulating that India must make "substantial progress toward concluding an additional protocol consistent with IAEA principles, practices, and policies that would apply to India's civil nuclear program," in order for a civilian nuclear cooperation agreement between the two countries to take effect.

121. Peter Crail, "IAEA Approves India Additional Protocol," *Arms Control Today*, April 2009, www.armscontrol.org/epublish/1/v39n3.

122. Alex Bollfrass, "Arms Control and Proliferation Profile: India," ACA, www.armscontrol.org/factsheets/indiaprofile.

123. Paul K. Kerr, "U.S. Nuclear Cooperation With India: Issues for Congress," CRS Report for Congress, RL33016, November 2008, http://assets.opencrs.com/rpts/RL33016_20081103.pdf.

124. UN Security Council, "Letter Dated 16 January 2006 From the Permanent Representative of India to the United Nations Addressed to the Chairman of the Committee," S/AC.44/2004/(02)/62, January 18, 2006, www.nti.org/e_research/official_docs/inventory/pdfs/1540_india_add1_20060116.pdf (inputs from India on the implementation of Resolution 1540).

125. David Albright, Paul Brannan, and Andrea Scheel, "An Inside Look: India's Procurement of Tributyl Phosphate (TBP) for Its Unsafeguarded Nuclear Program," *ISIS Report*, January 28, 2009, http://isis-online.org/uploads/isis-reports/documents/TBP_28January2009_1.pdf.

126. Ibid.

127. Bureau of International Information Programs, U.S. Department of State, "Highlights of Nuclear Security Commitments," April 13,

2010, www.america.gov/st/texttrans-english/2010/April/20100414171540ptellivremos0.8436396.html.

128. The first reported iteration of this policy was during a 1963 meeting between then-Prime Minister and current Israeli President Shimon Peres and U.S. President John F. Kennedy in which Peres stated, "I can tell you most clearly that we will not introduce nuclear weapons to the region, and certainly we will not be the first." Israeli officials have repeated variations of this statement since then. See Aver Cohen, *Israel and the Bomb* (Columbia: Columbia University Press, 1998), p.119.

129. David Danieli, Statement at the Conference on Facilitating the Entry Into Force of the Comprehensive Nuclear Test Ban Treaty, New York, September 24-25, 2009, www.ctbto.org/fileadmin/user_upload/Art_14_2009/240909_Afternoon_Session/240909_Israel.pdf.

130. IPFM, "Banning the Production of Fissile Materials for Nuclear Weapons," pp. 29-31.

131. IPFM, "Global Fissile Material Report 2009."

132. UN General Assembly, Resolution 63/41, A/RES/63/41, January 12, 2009.

133. Center for Defense Information, "Israel's Possible Nuclear Delivery Systems," Nuclear Weapons Database, http://www.cdi.org/nuclear/database/isnukes.html.

134. Stockholm International Peace Research Institute (SIPRI), *SIPRI Yearbook 2009: Armaments, Disarmament and International Security* (New York: Oxford University Press, 2009).

135. See ACA, "Nuclear Weapons: Who Has What at a Glance," n.d., www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat.

136. UN General Assembly, Resolution 64/57, A/RES/64/57, January 12, 2010; UN General Assembly, Resolution 64/3, A/RES/64/3, October 14, 2009; UN General Assembly, "General and Complete Disarmament: Renewed Determination Towards the Total Elimination of Nuclear Weapons," A/C.1/64/L.36, October 15, 2009, www.reachingcriticalwill.org/political/1com/1com09/res/L36.pdf.

137. In a September 2009 statement to the IAEA General Conference, Israel Atomic Energy Commission Director-General Shaul Chorev stated that progress toward creating a weapons of mass destruction (WMD)-free zone in the region "cannot be made without a fundamental change in regional circumstances, including a significant transformation in the attitude of states in the region towards Israel." Shaul Chorev, Statement to the 53rd General Conference of the International Atomic Energy Agency, September 2009, www.iaec.gov.il/docs/Statement2009-9-15.pdf.

138. 2010 NPT Review Conference Final Document, pt. IV, para. 5.

139. Eli Lake, "Israel Assails Resolution on Nuke Weapons as 'Flawed,'" *Washington Times*, March 30, 2010, www.washingtontimes.com/news/2010/may/30/deeply-flawed-nukes-conference-concerns-netanyahu/.

140. IAEA, "Safeguards Statement for 2008 and Background to the Safeguards Statement," n.d., www.iaea.org/OurWork/SV/Safeguards/es2008.html.

141. IAEA General Conference, "Israeli Nuclear Capabilities," GC(53)/RES/17, September 2009, www.iaea.org/About/Policy/GC/GC53/GC53Resolutions/English/gc53res-17_en.pdf.

142. Israel Atomic Energy Commission, "Israel and the Nuclear Suppliers Group (NSG) Continue Dialogue on Nuclear Exports Control and Non-Proliferation," May 14, 2009, www.iaec.gov.il/pages_e/dover_08-05-18.asp.

143. UN Security Council, "Letter Dated 22 November 2004 From the Permanent Representative of Israel to the United Nations Addressed to the Chairman of the Committee," S/AC.44/2004/(02)/84, December 29, 2004, www.nti.org/db/1540/pdfs/1540_israel_20041122.pdf (Israel report to the 1540 Committee).

144. Ibid.

145. "Pakistan Rules Out Test Ban Treaty Endorsement," Global Security Newswire, June 19, 2009, www.globalsecuritynewswire.org/gsn/nw_20090619_9389.php.

146. Zamir Akram, Statement to the UN General Assembly First Committee, New York, October 7, 2008.

147. Paul Kerr and Mary Beth Nikitin, "Pakistan's Nuclear Weapons: Proliferation and Security Issues," *CRS Report for Congress*, RL34248, February 23, 2010, www.fas.org/sgp/crs/nuke/RL34248.pdf.

148. Paul Brannan, "Steam Emitted From Second Khushab Reactor Cooling Towers; Pakistan May be Operating Second Reactor," *ISIS Report*, March 24, 2010, http://isis-online.org/isis-reports/detail/steam-emitted-from-second-khushab-reactor-cooling-towers-pakistan-may-be-op.

149. Zamir Akram, Statement at the Conference on Disarmament, Geneva, August 27, 2009, www.reachingcriticalwill.org/political/cd/speeches09/3session/27August_Pakistan.pdf.

150. Office of the Secretary of Defense, "Proliferation: Threat and Response," January 2001, p. 28, www.nti.org/e_research/official_docs/dod/2001/01thr_red.pdf.

151. Kerr and Nikitin, "Pakistan's Nuclear Weapons," p. 8.

152. Kerr and Nikitin, "Pakistan's Nuclear Weapons," p. 8.

153. Ibid., p. 4.

154. NASIC, "Ballistic and Cruise Missile Threat."

155. Ibid.

156. "Interview with President Asif Ali Zadari," *Larry King Live*, December 2, 2008 (hereinafter Zadari interview).

157. Since 1996 the issue of an NWFZ in South Asia has been raised in annual resolutions supporting a nuclear-weapon-free Southern Hemisphere, which welcomed steps to establish additional NWFZs, including in South Asia. In separate votes over whether to support such steps in the region, Pakistan has voted no since 2001. It abstained in those votes from 1996 to 2000. UN General Assembly, Resolution 64/44, A/RES/64/44, January 12, 2010, www.worldlii.org/int/other/UNGARsn/2009/91.pdf.

158. Zadari interview.

159. IAEA, "Country Nuclear Power Profile for Pakistan: 2009," April 2010, www-pub.iaea.org/MTCD/publications/PDF/cnpp2009/countryprofiles/Pakistan/Pakistan2006.htm.

160. Financial Action Task Force, "Proliferation Financing Report," June 18, 2008, pp. 35-42, www.fatf-gafi.org/dataoecd/14/21/41146580.pdf.

161. David Albright, Paul Brannan, and Andrea Scheel, "Detecting the Barrage Approach to Illicit Procurement," *ISIS Report*, January 12, 2009,http://isis-online.org/uploads/isis-reports/documents/Pakistan_Procurement_Karni_Khan_27Feb2009.pdf.

162. "Measures Taken by the Government of Pakistan to Strengthen Its Export Control System," n.d., http://exportcontrol.org/library/conferences/2705/D06a_10th_Export_Control_Conference_2.pdf.

163. Beginning in the 1970s, Pakistan operated a clandestine procurement network in order to acquire technologies for its nuclear weapons program. Khan used this network to supply uranium-enrichment technologies to Iran, Libya, North Korea, and possibly other countries. It is unclear to what extent this network is still

in operation, but Pakistani and U.S. officials have claimed that it has been shut down. Khan, who was placed under house arrest in 2004, has claimed that his activities were under the direction of the Pakistani government. See Richard P. Cronin, K. Alan Kronstadt, and Sharon Squassoni, "Pakistan's Nuclear Proliferation Activities and the Recommendations of the 9/11 Commission," *CRS Report for Congress*, RL32745, May 24, 2005. See also Peter Crail, "Abdul Qadeer Khan Freed From House Arrest," *Arms Control Today*, March 2009.

164. Rolf Mowatt-Larssen, "Nuclear Security in Pakistan: Reducing the Risks of Nuclear Terrorism," *Arms Control Today*, July/August 2009, www.armscontrol.org/act/2009_07-08/Mowatt-Larssen.

165. Ferroz Hassan Khan, "Nuclear Security in Pakistan: Separating Myth From Reality," *Arms Control Today*, July/August 2009, www.armscontrol.org/act/2009_07-08/khan.

166. Ibid.

167. Resolutions 1718 (2006) and 1874 (2009).

168. In an April 2009 Foreign Ministry statement announcing Pyongyang's intention to carry out nuclear testing, North Korea said the steps it would take to respond to UN Security Council censure earlier that month "will include nuclear tests and test-firings of intercontinental ballistic missiles." "UNSC Urged to Retract Anti-DPRK Steps," Korean Central News Agency, April 29, 2009, www.kcna.co.jp/item/2009/200904/news29/20090429-14ee.html.

169. Peter Crail, "N. Korea Launches Rocket, Renounces Talks," *Arms Control Today*, May 2009.

170. Choe Sang-Hun, "N. Korea Says It Has More Bomb-Grade Plutonium," New York Times, November 4, 2009.

171. Lt. Gen. Michael Maples, Statement before the U.S. Senate Committee on Armed Services, March 10, 2009, http://armed-services.senate.gov/statemnt/2009/March/Maples%2003-10-09.pdf.

172. "DPRK Completes Reprocessing of Spent Fuel Rods," Korean Central News Agency, November 3, 2009.

173. In March 2008, for example, an unnamed military commentator quoted in North Korea's official Korean Central News Agency said that South Korea "should bear in mind that once the more powerful preemptive strike of our own mode be launched, it will not merely plunge everything into flames but reduce it to ashes," a possible allusion to a nuclear strike. The remark was in response to suggestions of a potential preemptive conventional strike by South Korea against North Korea's nuclear facilities. "Military Commentator Blasts Outbursts of Chairman of Joint Chiefs of Staff of South Korean Forces," Korean Central News Agency, March 30, 2008, www.kcna.co.jp/item/2008/200803/news03/31.htm#2.

174. "Joint Declaration on the Denuclearization of the Korean Peninsula," February 19, 1992, www.fas.org/news/dprk/1992/920219-D4129.htm.

175. See, for example, UN Department of Public Information, "On Recommendation of First Committee, General Assembly Adopts 54 Texts."

176. IAEA, "Fact Sheet on DPRK Nuclear Safeguards," www.iaea.org/NewsCenter/Focus/IaeaDprk/fact_sheet_may2003.shtml.

177. Ibid.

178. Dennis C. Blair, "Annual Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence," February 2, 2010, http://intelligence.senate.gov/090212/blair.pdf.

179. UN Department of Public Information, "Security Council, Acting Unanimously, Condemns in Strongest Terms Democratic People's Republic of Korea Nuclear Test, Toughens Sanctions," SC/9679, June 12, 2009, www.un.org/News/Press/docs/2009/sc9679.doc.htm.

180. Resolutions 1737 (2006), 1747 (2007), 1803 (2008), and 1929 (2010).

181. See "Iran's Declaration Upon Signature to the CTBT," United Nations Treaty Collection, September 10, 1996, http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-4&chapter=26&lang=en.

182. The Executive Council is intended to be the primary decision-making body of the Comprehensive Test Ban Treaty Organization once the CTBT enters into force. The council is to comprise 51 member states elected to the body with a balanced geographic distribution.

183. Ali Asghar Soltanieh, Statement to the Fifth Conference on Facilitating the Entry Into Force of the CTBT, Vienna, September 17–18, 2007, www.ctbto.org/fileadmin/content/reference/article_xiv/2007/statements/1809_pm_session/1809pm_iran.pdf.

184. The "alleged studies" are a series of projects Iran is suspected to have carried out based on information a number of states have provided to the IAEA. The agency has said that the information raises questions about a "possible military dimension" to Iran's nuclear program. See IAEA Board of Governors, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions 1737 (2006), 1747 (2007) and 1803 (2008) in the Islamic Republic of Iran: Report by the Director General," GOV/2008/15, May 26, 2008, www.iaea.org/Publications/Documents/Board/2008/gov2008-15.pdf.

185. Iran sponsored UN General Assembly Resolution 3263 (XXIX) in 1974. The General Assembly has adopted similar resolutions every year since that time. See UN General Assembly, Resolution 64/26, A/RES/64/26, January 14, 2010, www.jewishvirtuallibrary.org/jsource/UN/unga64_26.pdf.

186. In September 2005, the IAEA Board of Governors adopted a resolution that found that Iran's undeclared nuclear activities prior to 2003 constituted noncompliance with its safeguards obligations. IAEA Board of Governors, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," GOV/2005/77, September 24, 2005, www.iaea.org/Publications/Documents/Board/2005/gov2005-77.pdf.

187. IAEA Board of Governors, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," GOV/2009/74, November 16, 2009, www.iaea.org/Publications/Documents/Board/2009/gov2009-74.pdf.

188. That provision, known as Code 3.1, is contained in subsidiary arrangements to a state's safeguards agreement with the IAEA. Until 1992, Code 3.1 required states to provide design information on nuclear facilities six months prior to the introduction of nuclear material. That year, the IAEA Board of Governors agreed that more time was needed to establish appropriate safeguards for facilities and required such information once the decision was made to construct the facilities. See Richard Hooper, "The System of Strengthened Safeguards," *IAEA Bulletin*, Vol. 39, No. 4 (1997), www.iaea.org/Publications/Magazines/Bulletin/Bull394/hooper.html.

189. See Peter Crail, "Iran's Outstanding Nuclear Issues at a Glance," ACA, www.armscontrol.org/node/3754.

190. Iranian Foreign Ministry Spokesman Mohammad-Ali Hosseini told reporters in September 2007, "[I]mplementation of the Additional Protocol could be resumed if the Iranian nuclear dossier would again return from the UN to the IAEA." "Additional Protocol Only If Dossier Returned to IAEA: Iran," *Hindustan Times*, September 2, 2007.

191. Resolutions 1737 (2006), 1747 (2007), 1803 (2008), and 1929 (2010) require all states to impose restrictions on importing and exporting NSG- and Missile Technology Control Regime (MTCR)-controlled items to and from Iran.

192. Bureau of International Security and Nonproliferation, U.S. Department of State, "Executive Order 13382," n.d., www.state.gov/t/isn/c22080.htm#iran.

193. David Albright, Paul Brannan, and Andrea Scheel Stricker, "Busting the Members at the Core of Iran's Smuggling Networks for Nuclear, Missile, and Conventional Military Goods," *ISIS Report*, February 16, 2010.

194. UN Security Council, "Note Verbale Dated 14 February 2006 From the Permanent Mission of the Islamic Republic of Iran to the United Nations," S/AC.44/2004/(02)/105/Add.1, February 18, 2006, www.nti.org/db/1540/pdfs/1540_iran_add1_20060214.pdf.

195. Ibid.

196. "Syria Proposes Mideast Free of WMD," CNN.com, April 17, 2003, http://edition.cnn.com/2003/WORLD/meast/04/16/sprj.irq.un.syria/.

197. The Dair al Zour site is also known as al Kibar. "Background Briefing With Senior U.S. Officials on Syria's Covert Nuclear Reactor and North Korea's Involvement," April 24, 2008, www.dni.gov/interviews/20080424_interview.pdf.

198. UN Department of Public Information, "On Recommendation of First Committee, General Assembly Adopts 54 Texts."

199. John Carlson, "IAEA Safeguards Additional Protocol," International Commission on Nuclear Non-proliferation and Disarmament, January 20, 2009, www.icnnd.org/research/IAEA_Additional_Protocol.pdf.

200. IAEA Board of Governors, "Implementation of the NPT Safeguards in the Syrian Arab Republic: Report of the Director General," GOV/2009/75, November 16, 2009.

201. Combined, UN Security Council Resolutions 1737 (2006) and 1803 (2008) prohibit states from receiving any MTCR-controlled items, materials, equipment, goods, and technology from Iran, and Resolution 1718 (2006) prohibits states from receiving such assistance from North Korea. See UN Security Council, "Letter Dated 13 October 2006 From the Permanent Representative of France to the United Nations Addressed to the President of the Security Council," S/2006/815, October 13, 2006.

202. "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, Covering 1 January to 31 December 2008," n.d., www.fas.org/irp/threat/wmd-acq2008.pdf.

203. See UN Security Council, "Note Verbale Dated 14 October 2004 From the Permanent Mission of the Syrian Arab Republic to the United Nations Addressed to the Chairman of the Committee," S/AC.44/2004/(02)/70, November 24, 2004, www.un.org/Docs/journal/asp/ws.asp?m=S/AC.44/2004/%2802%29/70; UN Security Council, "Note Verbale Dated 7 November 2005 From the Permanent Mission of the Syrian Arab Republic to the United Nations Addressed to the Chairman of the Committee," S/AC.44/2004/(02)/70/Add.3, November 10, 2005, www.un.org/Docs/journal/asp/ws.asp?m=S/AC.44/2004/%2802%29/70/Add.3.

204. "Indonesia to Ratify UN-Backed Pact Banning Nuclear Testing," UN News Service, May 4 2010, www.un.org/apps/news/story.asp?NewsID=34592&Cr=nuclear&Cr1.

205. "Statement by Egypt at the Sixth Conference on Facilitating the Entry Into Force of the Comprehensive Nuclear-Test-Ban Treaty, 24 September 2009."

206. A collective security alliance of Western states formed in 1949, NATO now comprises 28 states: Albania, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Turkey, the United Kingdom, and the United States.

207. Nonstrategic nuclear weapons are intended to support military objectives in a field of operations during a time of conflict. See Hans M. Kristensen, "Status of U.S. Nuclear Weapons in Europe," Federation of American Scientists, June 26, 2008, www.fas.org/programs/ssp/nukes/_images/EuroNukes.pdf. See also Amy Woolf, "Nonstrategic Nuclear Weapons," *CRS Report for Congress*, RL32572, January 14, 2010, www.fas.org/sgp/crs/nuke/RL32572.pdf.

208. See Oliver Meier, "German Nuclear Stance Stirs Debate," *Arms Control Today*, December 2009, www.armscontrol.org/act/2009_12/GermanNuclearStance.

209. See Caitlin Taber and Daryl Kimball, "Ministers Urge NATO Nuclear Policy Review," *Arms Control Today*, March 2010, www.armscontrol.org/act/2010_03/NATOReview.

210. Oliver Meier, "NATO Chief's Remarks Highlight Policy Rift," *Arms Control Today*, May 2010, www.armscontrol.org/act/2010_05/NATO.

211. Ibid.

212. See Oliver Meier, "NATO Experts Hedge on Nuclear Posture," *Arms Control Today*, June 2010, www.armscontrol.org/act/2010_06/NATONuclear.

213. Independent estimates suggest that Russia maintains about 2,050 deployed nonstrategic nuclear weapons. See Norris and Kristensen, "Nuclear Notebook: Russian Nuclear Forces, 2009."

214. IAEA, "IAEA Welcomes Entry Into Force of Treaty Joining Five States in Region," March 24, 2009.

215. Center for Nonproliferation Studies (CNS), "The Central Asian Nuclear-Weapon-Free Zone (CANWFZ)," May 25, 2009, http://cns.miis.edu/inventory/pdfs/canwz.pdf.

216. CNS, "African Nuclear-Weapon-Free Zone (Pelindaba Treaty)," August 13, 2009, http://cns.miis.edu/inventory/pdfs/anwfz.pdf.

217. NSG members are Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Kazakhstan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and the United States.

218. In 2004 the United States initially proposed a complete ban on selling enrichment and reprocessing technology to states that do not have them. Many NSG members opposed this idea and opted for a criteria-based approach to such transfers instead, which Washington rejected. In 2008, however, the United States reversed its position and agreed to pursue agreement on criteria for new transfers of those technologies. See Daryl G. Kimball, "Unfinished Business for the NSG," *Arms Control Today*, October 2008, www.armscontrol.org/act/2008_10/focus.

219. See Daniel Horner, "Accord on New Rules Eludes Nuclear Suppliers," *Arms Control Today*, July/August 2009, www.armscontrol.org/node/3729. See also Miles Pomper, "Nuclear Suppliers Make Progress on New Rules," *Arms Control Today*, December 2008, www.armscontrol.org/act/2008_12/NSG_progress.

220. See Daniel Horner, "G-8 Tightens Nuclear Export Rules," *Arms Control Today,* September 2009, www.armscontrol.org/act/2009_09/

G8. A grouping of eight of the world's major economies, Group of Eight members are Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States.

221. "G8 Muskoka Declaration and New Beginnings," http://g8.gc.ca/g8-summit/summit-documents/g8-muskoka-declaration-recovery-and-new-beginnings/.

222. The nuclear security summit was attended by 47 national delegations: Algeria, Argentina, Armenia, Australia, Belgium, Brazil, Canada, Chile, China, Czech Republic, Egypt, Finland, France, Georgia, Germany, India, Indonesia, Israel, Italy, Japan, Jordan, Kazakhstan, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Philippines, Poland, Republic of Korea, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Arab Emirates, the United Kingdom, the United States and Vietnam; as well as the heads of the United Nations, the IAEA, and the European Union.

223. Office of the Press Secretary, The White House, "Highlights of the National Commitments Made at the Nuclear Security Summit," April 13, 2010, www.whitehouse.gov/the-press-office/highlights-national-commitments-made-nss.

APPENDIX

Glossary of Terms

1997 Model Additional Protocol: An agreement designed for states having a safeguards agreement with the International Atomic Energy Agency (IAEA), in order to strengthen the effectiveness and improve the efficiency of the safeguards system as a contribution to global nuclear nonproliferation objectives. The protocol empowers the IAEA to inspect facilities throughout the state. Based on the Model Additional Protocol detailed in IAEA document INFCIRC/540 (Corrected), it is currently a voluntary measure supplementing the Comprehensive Safeguards Agreement.

Committee established pursuant to UN Security Council Resolution 1540 (1540 Committee): A UN Security Council committee established in 2004 to monitor the implementation of Resolution 1540.

Committee established pursuant to UN Security Council Resolution 1718 (1718 Committee): A UN Security Council committee established in 2006 to monitor the implementation of UN sanctions against North Korea adopted under Resolutions 1718 (2006) and 1874 (2009). Both resolutions required states to submit reports on their efforts to carry out those sanctions.

Committee established pursuant to UN Security Council resolution 1737 (1737 Committee): A UN Security Council committee established in 2006 to monitor the implementation of UN sanctions against Iran adopted under Resolutions 1737 (2006), 1747 (2007), 1803 (2008), and 1929 (2010). Each resolution required states to submit reports on their efforts to carry out those sanctions.

Conference on Disarmament (CD): The lone multilateral disarmament negotiating forum of the international community, established in 1979 as a result of the first Special Session on Disarmament of the United Nations General Assembly, held in 1978. The CD, based in Geneva, comprises 65 member states and is sponsored by the United Nations.

Convention on the Physical Protection of Nuclear Material (CPPNM): The only international legally binding undertaking in the area of physical protection of nuclear material. Signed in Vienna and New York on March 3, 1980, it establishes measures related to the prevention, detection, and punishment of offenses relating to nuclear material. A diplomatic conference in July 2005 was convened to amend the convention and strengthen its provisions. The amended convention makes it legally binding for states-parties to protect nuclear facilities and material in peaceful domestic use and storage as well as transport. It provides for expanded cooperation between and among states regarding rapid measures to locate and recover stolen or smuggled nuclear material, mitigate any radiological consequences of sabotage, and prevent and combat related offenses. The amendments will take effect once they have been ratified by two-thirds of the states-parties of the convention.

Convention for the Suppression of Acts of Nuclear Terrorism (Nuclear Terrorism Convention): International agreement opened for signature in 2005 that criminalizes the planning, threatening, or implementation of acts of nuclear terrorism and requires states-parties to pass national legislation to that effect.

Comprehensive Safeguards Agreement (CSA): The current nuclear Nonproliferation Treaty (NPT) standard of verification required by Article III of the treaty. A CSA allows the International Atomic Energy Agency (IAEA) to monitor all nuclear facilities and materials that are declared by the state, but does not give the agency authority to investigate undeclared sites (see 1997 Model Additional Protocol).

Comprehensive Test Ban Treaty (CTBT): The international treaty that prohibits all nuclear explosions on Earth. A global alarm system of 337 facilities worldwide is being established to monitor compliance with the treaty and, once completed, will monitor for any sign of an underground, atmospheric, or underwater nuclear explosion.

It was negotiated between 1994 and 1996 and opened for signature on September 24, 1996, at the UN General Assembly in New York.

Comprehensive Test Ban Treaty Organization (CTBTO): The Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, known by the acronym CTBTO, is the organization set up to implement the provisions of the Comprehensive Test Ban Treaty (CTBT). CTBTO activities include the establishment of a global verification regime to monitor compliance with the treaty and the promotion of the CTBT signature and ratification for early entry into force. The CTBTO was established on November 19, 1996, and consists of a plenary body of state signatories and the Provisional Technical Secretariat. The Comprehensive Nuclear-Test-Ban Treaty Organization, which will also be known by the acronym CTBTO, will be established after entry into force of the CTBT.

Dual-use item: An item that has both civilian and military applications.

Enrichment: Uranium enrichment increases the percentage of fissile uranium-235 in a batch of nuclear fuel. Low levels of enrichment are suitable for use in civilian nuclear power reactors, while highly enriched uranium (HEU) can be used to build a nuclear weapon.

Final Document: The final product of a nuclear Nonproliferation Treaty review conference, the document represents the consensus view of the states-parties.

Fissile material: Material that contains elements whose nuclei are able to be split by neutrons of various speeds. Uranium-233, uranium-235, and plutonium-239 are all fissile materials. Fissile materials undergo fission more easily than other fissionable materials and are more desirable for most reactor types and essential for nuclear explosives.

Fissile material cutoff treaty (FMCT): A treaty that would end the production of fissile material for weapons purposes and may or may not address existing stocks (see Shannon mandate). Such a treaty is under discussion at the Conference on Disarmament.

Full-scope safeguards: See Comprehensive Safeguards Agreement.

Global Initiative to Combat Nuclear Terrorism: A voluntary association of states, established in 2006, committed to sharing information and expertise in order to prevent nuclear terrorism. Seventy-six states currently participate in the initiative.

Global Partnership Against the Spread of Weapons and Materials of Mass Destruction: An initiative launched in 2002 at the Group of Eight summit in Kananaskis to prevent terrorists or those who harbor them from acquiring or developing nuclear, chemical, radiological, and biological weapons; missiles; and related materials, equipment, and technology.

Global Threat Reduction Initiative (GTRI): A collaborative program aimed at reducing and protecting vulnerable nuclear and radiological materials located at civilian sites worldwide. Launched in 2004, the GTRI helps the U.S. Department of Energy achieve its nuclear security goal to prevent the acquisition of nuclear and radiological materials for use in weapons of mass destruction and other acts of terrorism by repatriating or otherwise securing nuclear fuel and converting reactors to use new, more proliferation-resistant technology. Three key subprograms of the GTRI—convert, remove, and protect—provide a comprehensive approach to denying terrorists access to nuclear and radiological materials. The program is run by the National Nuclear Security Administration.

Group of Nonaligned States: A 118-member bloc of developing states, the largest group in the nuclear Nonproliferation Treaty context, also known as Nonaligned Movement (NAM).

Highly Enriched Uranium (HEU): Uranium that has been processed to increase the proportion of the U-235 isotope to more than 20 percent. HEU is required for the construction of a gun-type nuclear device, the simplest type of nuclear weapon. The greater the proportion of U-235, i.e., the higher the enrichment level, the less material that is needed to cause a nuclear detonation. Weapons-grade uranium generally refers to uranium enriched to at least 90 percent, but material of far lower enrichment levels can be used to create a nuclear explosive device.

IAEA Nuclear Security Fund: A voluntary funding mechanism, to which International Atomic Energy Agency (IAEA) member states are called on to contribute. The fund was established to support, among others things, the implementation of nuclear security activities to prevent, detect, and respond to nuclear terrorism. The fund was

extended when, in September 2005, the IAEA Board of Governors approved a new nuclear security plan covering 2006 to 2009.

Illicit Trafficking Database (ITDB): The International Atomic Energy Agency information system on incidents of illicit trafficking and other unauthorized activities and events involving nuclear and radioactive materials. Established in 1995, the ITDB facilitates the exchange of authoritative information on incidents among states. As of September 2009, 107 states participated in the ITDB program. In some cases, nonparticipating member states have provided information to the ITDB.

INFCIRC/66-type safeguards agreement: The model safeguards agreement approved by the International Atomic Energy Agency (IAEA) in February 1965 to safeguard individual nuclear facilities. The guidelines were later revised to include reprocessing and fuel fabrication plants. It was most widely employed prior to the advent of the 1968 nuclear Nonproliferation Treaty, which required full-scope safeguards. INFCIRC/66-type safeguard agreements leave a broad scope of practical decisions to the IAEA as well as to the discretion of its inspectors.

International Atomic Energy Agency (IAEA): International organization based in Vienna charged with monitoring and safeguarding nuclear material and facilities under the nuclear Nonproliferation Treaty and with helping states pursue peaceful nuclear programs through technical cooperation. It was set up as the world´s Atoms for Peace organization in 1957 within the UN structure. The IAEA Secretariat is a team of 2,200 multidisciplinary professional and support staff from more than 90 countries. The agency is led by Director-General Yukiya Amano and six deputy directors-general who head the major departments.

Missile Technology Control Regime (MTCR): An informal and voluntary association of countries that share the goals of nonproliferation of unmanned delivery systems capable of delivering weapons of mass destruction and that seek to coordinate national export licensing efforts aimed at preventing their proliferation. The MTCR was originally established in 1987 by Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. Since that time, the number of MTCR partner countries has increased to 34. The MTCR relies on adherence to common export policy guidelines (the MTCR Guidelines) applied to an integral common list of controlled items (the MTCR Equipment, Software and Technology Annex). The regime places particular focus on missiles capable of delivering a payload of at least 500 kilograms over a distance of at least 300 kilometers, so-called Category I, or MTCR-class, missiles.

New Strategic Arms Reduction Treaty (New START): An arms reduction treaty signed by President Barack Obama and President Dmitry Medvedev on April 8, 2010, in Prague. New START consists of the treaty text, a protocol to the treaty, and technical annexes to the protocol. Under the treaty, the United States and Russia will be limited to significantly fewer strategic arms within seven years from the date the treaty enters into force. The limits are 1,550 warheads (warheads on deployed intercontinental ballistic missiles [ICBMs] and deployed submarine-launched ballistic missiles [SLBMs] count toward this limit and each deployed heavy bomber equipped for nuclear armaments counts as one warhead toward this limit); a combined limit of 800 deployed and nondeployed ICBM launchers, SLBM launchers, and heavy bombers equipped for nuclear armaments; and a separate limit of 700 deployed ICBMs, deployed SLBMs, and deployed heavy bombers equipped for nuclear armaments. The treaty's verification regime includes on-site inspections and exhibitions, data exchanges and notifications related to strategic offensive arms and facilities covered by the treaty, and provisions to facilitate the use of national technical means for treaty monitoring. It also provides for the exchange of telemetry. The treaty's duration will be 10 years, unless superseded by a subsequent agreement. The U.S. Senate and the Russian Duma must approve the treaty before it can enter into force. The treaty does not contain any constraints on testing, development, or deployment of current or planned U.S. missile defense programs or current or planned U.S. long-range conventional strike capabilities.

No-first-use pledge: A pledge on the part of a nuclear-weapon state not to be the first party to use nuclear weapons in a conflict or crisis. No-first-use guarantees may be made in unilateral statements, in bilateral or multilateral agreements, or as part of a treaty creating a nuclear-weapon-free zone.

Non-nuclear-weapon state: As defined by the nuclear Nonproliferation Treaty, any state that did not detonate a nuclear explosive device prior to January 1, 1967.

Nuclear-weapon state: As defined by nuclear Nonproliferation Treaty Article IX, a state that

manufactured and exploded a nuclear weapon prior to January 1, 1967. Those states are China, France, Russia, the United Kingdom, and the United States.

Nuclear fuel cycle: The life cycle of uranium used as fuel for a reactor. The "front end" of the cycle (prior to use in a reactor) includes mining, milling, and enrichment. After uranium has been used in a reactor, the spent fuel can be placed in long-term storage or reprocessed (the "back end" of the cycle). Reprocessing allows a portion of the spent fuel to be returned to a reactor as useable fuel, but is costly and presents a proliferation risk.

Nuclear Nonproliferation Treaty (NPT): International agreement on nuclear disarmament, nonproliferation, and the peaceful use of nuclear energy that entered into force March 5, 1970. Nuclear-armed states-parties pledged to work toward disarmament, non-nuclear-weapon states-parties agreed to forswear nuclear weapons, and all agreed to share in the peaceful use of nuclear energy.

Nuclear Posture Review (NPR): A periodic review of U.S. nuclear strategy, mandated by Congress.

2010 nuclear security summit: A meeting of 47 national delegations and the European Union, the International Atomic Energy Agency (IAEA), and the United Nations held in Washington, DC, April 12–13, 2010, to enhance international cooperation in preventing nuclear terrorism. The participants agreed on a communiqué and a work plan. In their national statements, many states described specific steps they will take to advance nuclear security. The summit was first proposed by President Barack Obama in an April 2009 speech in Prague where he outlined his vision of a world free of nuclear weapons and nuclear threats.

Nuclear Suppliers Group (NSG): A group of nuclear supplier countries that seeks to contribute to the nonproliferation of nuclear weapons through the implementation of guidelines for nuclear and nuclear-related exports. The NSG guidelines are implemented by each participating government in accordance with its national laws and practices. Decisions on export applications are taken at the national level in accordance with national export licensing requirements. The NSG was founded in 1974 and currently has 46 members.

Nuclear-Weapon-Free Zone (NWFZ): A specified region in which countries commit themselves not to manufacture, acquire, test, or possess nuclear weapons, but may use nuclear energy for peaceful purposes. Five such zones exist today, in Latin America (the 1967 Treaty of Tlatelolco), the South Pacific (the 1985 Treaty of Rarotonga), Southeast Asia (the 1995 Treaty of Bangkok), Africa (the 1996 Treaty of Pelindaba), and Central Asia (the 2006 Treaty of Semipalatinsk). Article VII of the nuclear Nonproliferation Treaty affirms the right of countries to establish specified zones free of nuclear weapons. Each treaty establishing an NWFZ includes a legally binding protocol calling on the nuclear-weapon states to respect the status of the zones and not to use or threaten to use nuclear weapons against treaty states-parties, also known as negative security assurances.

Principles and Objectives, 1995: As part of the package of agreements that secured the indefinite extension of the nuclear Nonproliferation Treaty at the 1995 review and extension conference, states-parties agreed to a set of principles covering disarmament, nonproliferation, and peaceful uses of nuclear energy. The principles included support for the Comprehensive Test Ban Treaty and a fissile material cutoff treaty, endorsed the establishment of a nuclear-weapon-free zone in the Middle East, and called for states to require that Comprehensive Safeguards Agreements be a condition of nuclear trade.

Preparatory Committee (PrepCom): Each nuclear Nonproliferation Treaty review conference is preceded by PrepCom meetings in each of the three years prior to the conference. The PrepComs decide on procedural matters such as the agenda for the review conference and may also issue substantive recommendations.

Proliferation Security Initiative (PSI): A global, nonbinding effort of 95 states, launched in 2003, that aims to stop trafficking of weapons of mass destruction, their delivery systems, and related materials to and from states and nonstate actors of proliferation concern. The PSI operates on the basis of existing international and national law and does not create any new powers or responsibilities. When a country endorses the PSI, it endorses the PSI Statement of Interdiction Principles, which commit participants to establish a more coordinated and effective basis through which to impede and stop weapons of mass destruction, their delivery systems, and related items.

Prompt Launch: A nuclear strategy under which a state launches their missiles at the first warning of a nuclear launch, before its launch sites are destroyed.

Reprocessing: A chemical process whereby uranium and plutonium may be extracted from used nuclear fuel and returned to the fuel supply. Reprocessing can increase the amount of energy extracted from a batch of fuel, but is costly and presents proliferation risks.

Research reactor: Small nuclear reactors used for scientific research and the production of radioactive materials used in medicine and industry. Many utilize highly enriched uranium as a fuel, unlike larger civilian power reactors, which operate on low-enriched uranium.

Resolution 984: A UN Security Council resolution passed in 1995 formally acknowledging the commitments of the nuclear-weapon states to negative security assurances. All nuclear-weapon states except China made reservations, however, and have expressed in their military doctrines that using nuclear weapons against non-nuclear-weapon states could be an option under certain circumstances. A resolution is not considered to be legally binding, and the assurances in Resolution 984 are conditional.

Resolution 1540: A UN Security Council resolution passed in 2004 mandating that states establish domestic controls to prevent nonstate actors from acquiring nuclear, chemical, and biological weapons or related materials.

Resolution 1887: A UN Security Council resolution passed in September 2009 committing states to work toward a world without nuclear weapons and endorsing a broad framework of actions to reduce global nuclear dangers. The resolution includes new provisions to deter withdrawal from the nuclear Nonproliferation Treaty and to ensure that a peaceful nuclear program is not diverted to a weapons program. The resolution called on states to conclude safeguards agreements and an additional protocol with the International Atomic Energy Agency and for strengthened implementation for Resolution 1540.

Review Conference (RevCon): Conferences of the nuclear Nonproliferation Treaty states-parties held every five years to review and enhance the implementation of the treaty.

Shannon mandate: A 1995 compromise on fissile material cutoff treaty negotiating parameters set out by Canadian Ambassador Gerald Shannon, according to which the formal mandate for fissile materials negotiations would focus on a "ban on the production of fissile material," but would allow delegations to raise other issues, including controls on and reductions of existing stocks, during the course of negotiations.

Small Quantities Protocol (SQP): An International Atomic Energy Agency (IAEA) protocol introduced in 1974 to simplify the application of safeguards for non-nuclear-weapon states party to the NPT that do not have significant inventories of nuclear material and have no nuclear material in a "facility," as defined in the model comprehensive safeguards agreement. The SQP holds in abeyance certain reporting requirements and safeguards inspections, with the understanding that the SQP will lapse if the state undertakes significant nuclear activities. Because the limits on IAEA access to an SQP state were identified as a possible safeguards vulnerability, in 2006 the IAEA Board of Governors introduced a revised SQP. The revised SQP provides for states to make annual declarations of their holdings of nuclear materials, in effect requiring them to actively declare that they still qualify for their SQP.

Strategic Arms Reduction Treaty (START): Signed in 1991, START limits the United States and Russia to no more than 6,000 strategic warheads on 1,600 delivery vehicles. The treaty contains extensive counting rules and verification procedures. It expired Dec. 5, 2009.

Strategic Offensive Reductions Treaty (SORT): Signed in 2002, SORT limits the United States and Russia to 1,700 to 2,200 operationally deployed strategic nuclear warheads by Dec. 31, 2012, the day the treaty expires. The treaty does not contain counting rules or verification procedures.

Tactical nuclear weapons: Nuclear weapons typically deployed on shorter-range delivery systems intended for use on the battlefield.

Treaty of Bangkok (Southeast Asia Nuclear-Weapon-Free Zone Treaty). A treaty that prohibits the development, manufacture, acquisition, and testing of nuclear weapons anywhere within the region of the 10 full-member parties: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. It also prohibits the transport of nuclear weapons through the region. Signatories undertake to enact International Atomic Energy Agency safeguards and to refrain from dumping at sea, discharging into the atmosphere, or burying on land any radioactive material or waste. Opened for signature in December 1995, the treaty entered into force in March 1997. All 10 states-parties have

ratified the treaty, although none of the nuclear-weapon states have signed the treaty's protocols.

Treaty of Pelindaba (African Nuclear-Weapon-Free Zone Treaty). A treaty that prohibits the research, development, manufacturing, stockpiling, acquisition, testing, possession, control, and stationing of nuclear explosive devices in the members' territory. The treaty also prohibits the deposit of radioactive waste originating from outside the continent within the region. Under the treaty, signatories are required to put all their nuclear programs under International Atomic Energy Agency safeguards. The treaty provides for the establishment of the African Commission on Nuclear Energy, which will supervise treaty implementation and ensure compliance. The treaty was opened for signature in Cairo in April 1996 and entered into force in July 2009. As of May 2010, there were 28 parties to the treaty and an additional 23 signatories. China, France, and the United Kingdom have ratified the treaty's protocols while the Russian Federation and the United States have not.

Treaty of Rarotonga (South Pacific Nuclear-Weapon-Free Zone Treaty). A treaty that prohibits the testing, manufacturing, acquiring, and stationing of nuclear explosive devices in any member's territory. The treaty prohibits dumping radioactive wastes into the sea. In addition, the treaty requires all parties to apply International Atomic Energy Agency safeguards to all their peaceful nuclear activities. It was opened for signature on August 6, 1985, and entered into force on December 11, 1986. As of March 2008, there were 13 parties to the treaty: Australia, Cook Islands, Fiji, Kiribati, Nauru, New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. The treaty has three protocols that refer to provisions of territories within the zone that belong to China, France, Russia, the United Kingdom, and the United States. All five nuclear-weapon states have signed the protocols.

Treaty of Semipalatinsk (Central Asian Nuclear-Weapon-Free Zone Treaty). In force since March 21, 2009, the treaty is the first of its kind comprising states of the former Soviet Union and is the first such zone in the Northern Hemisphere. It forbids the development, manufacture, stockpiling, acquisition, or possession of any nuclear explosive device within the zone. Peaceful uses of nuclear energy are permitted if placed under enhanced International Atomic Energy Agency (IAEA) safeguards. The treaty is the first to explicitly oblige Central Asian countries to accept enhanced IAEA safeguards on their nuclear material and activities. The treaty encompasses an environmental component that addresses concerns unique to the Central Asian region. Five countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) are parties to the treaty. France, the United Kingdom, and the United States objected to the treaty, expressing concerns about the article regarding previous international agreements. The United States also objected to a provision in the draft treaty that provided for the possible expansion of the treaty to neighboring states. Another objection expressed by France, the United Kingdom, and the United States relates to provisions of the treaty governing the possible transit of nuclear weapons through the zone.

Treaty of Tlatelolco (Nuclear-Weapon-Free Zone Treaty in Latin America and the Caribbean). A treaty that created a nuclear-weapon-free zone in Latin America and the Caribbean and was the first international agreement aimed at excluding nuclear weapons from an inhabited region of the globe. In addition to prohibiting nuclear testing by all states-parties, member states accept the application of International Atomic Energy Agency safeguards for all their nuclear activities to assist in verifying compliance with the treaty. The treaty establishes a regional organization, the Agency for the Prohibition of Nuclear Weapons in Latin America, to help ensure compliance with its provisions. The treaty was opened for signature on February 14, 1967, and entered into force on April 25, 1969. It has since been signed and ratified by all 33 nations of Latin America and the Caribbean, with Cuba being the last country to ratify it on October 23, 2002. China, France, the Netherlands, the Russian Federation, the United Kingdom, and the United States have signed the relevant protocols of the treaty.

United Nations (UN): An international organization founded in 1945 after the Second World War by 51 countries committed to maintaining international peace and security, developing friendly relations among nations, and promoting social progress, better living standards and human rights. Due to its unique international character and the powers vested in its founding charter, the organization can take action on a wide range of issues and provide a forum for its 192 member states to express their views, through the UN General Assembly, Security Council, Economic and Social Council, and other bodies and committees. The organization works on a broad

range of fundamental issues, from sustainable development, environment and refugees protection, disaster relief, counterterrorism, disarmament, and nonproliferation to promoting democracy, human rights, governance, economic and social development, and international health; clearing landmines; expanding food production; and more, in order to achieve its goals and coordinate efforts for a safer world for this and future generations.

UN General Assembly First Committee on Disarmament and International Security: A subsidiary of the UN General Assembly responsible for drafting resolutions on disarmament issues. The First Committee meets every year in October for 4 to 5 weeks after the UN General Assembly General Debate. All 192 UN member states can attend.

UN General Assembly: Established in 1945 under the Charter of the United Nations, the UN General Assembly occupies a central position as the chief deliberative, policymaking, and representative organ of the United Nations. Comprising all 192 UN members, it provides a unique forum for multilateral discussion of the full spectrum of international issues covered by the charter. It plays a significant role in the process of standard-setting and the codification of international law. The assembly meets in regular session intensively from September to December each year, and thereafter as required. Each member state in the assembly has one vote. Votes taken on designated important issues, such as recommendations on peace and security and the election of Security Council members, require a two-thirds majority of member states, but other questions are decided by simple majority.

Zangger Committee: A group of 37 nuclear exporting states, formed in 1971, with the purpose of maintaining a "trigger list" of sources of special fissionable materials and equipment or materials especially designed or prepared for the processing, use, or production of special fissionable materials. Additionally, the committee has identified certain dual-use technologies as requiring safeguarding when they are supplied to non-nuclear-weapon states to be used for nuclear purposes. These include explosives, centrifuge components, and special materials. The committee, named after its first chairman, Claude Zangger of Switzerland, is an informal arrangement, and its decisions are not legally binding on its members.

The Arms Control Association (ACA), founded in 1971, is a national nonpartisan membership organization dedicated to promoting public understanding of and support for effective arms control policies. Through its public education and media programs and its magazine, *Arms Control Today (ACT),* ACA provides policy-makers, the press and the interested public with authoritative information, analysis and commentary on arms control proposals, negotiations and agreements, and related national security issues. In addition to the regular press briefings ACA holds on major arms control developments, the Association's staff provides commentary and analysis on a broad spectrum of issues for journalists and scholars both in the United States and abroad.

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